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■

CELLULAR, TRUNK AND CONVENTIONAL COMMUNICATIONS SYSTEMS

Land Mobile Allocations at 900 MHz

Title 47—Telecommunication

CHAPTER I—FEDERAL COMMUNICATIONS COMMISSION

[Do. 18262; FCC 75-324]

LAND MOBILE SERVICE

Operations Between 806–960 MHz

In the matter of an inquiry relative to the future use of the frequency band 806–960 MHz; and Amendment of Parts 2, 18, 21, 73, 74, 89, 91, and 93 of the rules relative to operations in the land mobile service between 806–960 MHz.

Preliminary statement. 1. We have before us the petitions for reconsideration and for associated relief filed in this proceeding.[1] These pleadings are directed to the action taken by us in our *Second Report and Order*.[2]

2. In our Second Report and Order we allocated a total of 40 MHz of radio spectrum (825–845 MHz and 870–890 MHz) to the development of a nationwide, broadband, "cellular" mobile radio communication system. These facilities were to serve the future needs of the public for mobile radio-telephone service. For the reasons given in the Second Report and Order, it was decided to license only wire line telephone companies to construct and operate such cellular systems. In addition, we allocated 30 MHz of radio spectrum (806–821 MHz and 851–866 MHz) for the development of "trunked" and "conventional" radio systems[3] to serve the mobile radio communication requirements of the specialized radio services governed by Parts 89, 91 and 93 of our rules.[4] As an interim measure, we planned to authorize "trunked" systems to provide mobile radiotelephone service to eligibles in these services as well as to the public. Further, we held 45 MHz in reserve for future needs; and we also adopted new technical, operational, and regulatory approaches designed to develop the new radio spectrum more effectively and efficiently.

3. The petitions for reconsideration have raised a number of issues; and we have carefully reconsidered our decision in the light of the arguments presented; and we have modified it in certain respects. However, for the reasons given in this opinion, we have decided to affirm the basic approach we followed in our Second Report and Order.

Summary of modifications to second report and order. 4. Although we have retained the original allocation of 40 MHz for the development of cellular systems, we have modified the plan to permit licensing of other than wire line carriers to develop and operate cellular systems. (See Part IV, paragraph 24 et seq., infra.)

5. As we have mentioned, our original plan included an interim provision for licensing "trunked" systems to provide radiotelephone service for the use of eligibles and others. On reconsideration, we have concluded that this provision is not necessary to our objectives in allocating the 30 MHz of spectrum to the Public Safety, Industrial and Land Transportation Radio Services. We are now persuaded that these interim requirements for radiotelephone service can be better met by a simplified "cell" system which would form the nucleus of the more complex "cellular" facilities we have provided for. Such needs can also be met on frequencies which have been allocated previously, particularly frequencies in the 470–512 MHz band which have been made available to the "miscellaneous common carriers"—the radio common carriers (RCC's).[5] Outside the major markets, other bands can be used.[6] Thus, this feature of our plan is not essential to or compatible with our primary objectives; and, accordingly, we have eliminated it. At the same time the rule requiring wire line telephone companies to provide interconnection becomes unnecessary; and it has been dropped. Should it develop in the future that radiotelephone requirements are not being satisfied either by our "cellular" program or through systems operating on frequencies in the lower bands, the matter will be revisited and appropriate steps will be taken to meet the needs of the public for their type of service. There are, of course, frequencies in the 900-MHz reserve pool.

6. There is, we recognize, some tension between the goals of promoting competitive considerations on the one hand and taking full advantage of accumulated corporate expertise on the other. Authorizing radio equipment manufacturers to operate as many as five "trunked" systems might have an adverse effect on the competition. But at the same time it is undeniable that the manufacturers have the expertise, incentives, and the resources available at the present time to go forward with "trunked" systems at 900 MHz. These systems are indispensable to the full development of communications at 900 MHz. To strike a balance between these two considerations, it has been decided to allow land mobile radio equipment manufacturers[7] an opportunity to establish and operate a model "trunked" system in order to allow them to demonstrate whether such facilities make economic and engineering sense at 900 MHz, and if so, for what applications. If, in the future, it should be made to appear to our satisfaction that the limitation of one 20-channel "trunked" sytem nationwide has an adverse impact on the development of such facilities, we will at that time consider what further action the public interest requires.[8]

7. It has also been suggested that some limits be placed on the number of "trunked" systems that we will license to other enterpreneurs in order to preserve the competition at 900 MHz. We

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[1] The petitions for reconsideration and those for associated relief are listed at Appendix A, which is filed as part of the original document. In addition to the petitions for reconsideration, requests for associated relief have been made. These are, specifically, the "Petition for Stay and Suggestion for Suspension of Effective Date," filed June 17, 1974, by the National Association of Radiotelephone Systems; the "Petition to Intervene," filed by General Communications Engineering, Inc., on November 7, 1974; and the "Motion for Leave to File Additional Pleading," and the "Supplement to Petition for Stay: Motion to Set Aside Previous Order; and Motion to Reopen Proceeding and to Hold Evidentiary Hearing Before Full Commission," submitted November 29, 1974, by the National Association of Radiotelephone Systems. We will consider and dispose of these pleadings in this opinion.

[2] Land Mobile Radio Service, Second Report and Order, Docket 18262, 46 FCC 2d 752 (1974).

[3] In simplest terms, a "trunked" radio system is a radio communication facility employing between five and twenty channel pairs. Channel access by any user at any time is controlled by a computer which assigns that user the first available channel or places the "call" in a waiting line until a circuit becomes available. A "conventional" facility is a radio communication system employing a maximum of five channel pairs. Automatic "trunking" techniques may be used but are not required. "Conventional" radio communication facilities are characteristic of land mobile systems presently authorized in the Public Safety, Industrial, and Land Transportation Radio Services.

[4] The land mobile services governed by Parts 89, 91 and 93 are known, respectively, as the Public Safety, Industrial and Land Transportation Radio Services. These services are part of a larger group of services collectively known as the Safety and Special Radio Services. The Part 89 Public Safety Radio Services include: The Local Government, Police, Fire, Highway Maintenance, Forestry-Conservation, Special Emergency, and State Guard Radio Services. In the Part 91 Industrial Radio Services, there are the: Power, Petroleum, Forest Products, Motion Picture, Relay Press, Special Industrial, Business, Manufacturers, and Telephone Maintenance Radio Services. And the Part 93 Land Transportation Radio Services include the: Motor Carrier, Railroad, Taxicab, and Automobile Emergency Radio Services.

[5] Land Mobile-UHF TV Channel Sharing, Second Report and Order, Docket 18261, 30 FCC 2d 221 (1971). As none of these channels have been assigned, they are still available for this purpose.

[6] The 470–512 MHz band frequencies are available in the following Urbanized Areas: Boston, Massachusetts; Chicago, Illinois; Dallas-Fort Worth, Texas; Houston, Texas; Los Angeles, California; Miami, Florida; New York-Northwestern New Jersey; Philadelphia, Pennsylvania; Pittsburgh, Pennsylvania; San Francisco-Oakland, California; and Washington, D.C. Frequencies in the 470–512 MHz band were made available in Dallas-Fort Worth and Houston, Texas, and Miami, Florida in our Fifth Report and Order in Docket No. 18261, Land Mobile UHF-TV Sharing Plan, 48 FCC 2d 360 (1974).

[7] The term "manufacturer" refers to businesses engaged in the manufacture of radio frequency ("RF") equipment designed for use in land mobile communication systems.

[8] We expressed a similar concern and an intention to review this matter in the Second Report and Order, Docket No. 18262, supra, fn. 2, at p. 781.

have no evidence before us suggesting that domination of this field by licensees with an unfair competitive advantage over their economic rivals is at all probable. However, we plan closely to supervise the development at "trunked" systems; should it appear that anti-competitive behavior by any entrant in this field seriously compromises our policies, we will take whatever corrective action seems warranted.

8. We are adopting the suggestion of a number of the petitioners that in order to maintain more effective control over the use of specialized mobile radio systems (SMR systems)* the Commission ought separately to license the mobile and control stations (or control points) operated by eligible users. It is compatible with the basic philosophy governing the Public Safety, Industrial, and Land Transportation Radio Services. Therefore, we will modify our procedures to accomplish this.

9. These are the major changes we have made in our Second Report and Order. Other changes are dealt with in the opinion which follows.

Allocation matters. 10. Petitions for Reconsideration filed by the American Telephone and Telegraph Company (AT&T) and by Motorola, Inc. (Motorola) are directed to the amount of radio spectrum we have allocated for use by "cellular" systems. AT&T urged that the amount be increased from 40 MHz to 64 MHz, the original amount proposed by AT&T. Motorola's petition is primarily directed to the methods we should use in making the 40 MHz of spectrum available for use in cellular systems. We have considered these petitions, but we find nothing in them which requires or warrants modification of our decision in this matter.

11. AT&T claims that it has developed certain "attractive" design changes, including the possibility of shared use of the electronic switching offices by both the "mobile" and the "wire line" services, but that if these changes are implemented, the cost of the "cellular" system would be more "spectrum sensitive" than in its original design. In other words, by reducing the amount of spectrum from 64 MHz to 40 MHz, the increase in the costs of the base station facilities would not be 20 percent, as originally estimated, but 50 percent, if the planned design changes are made.

12. We have reviewed AT&T's petition in the light of all of the information previously submitted in the long course of this proceeding and in the light of what we conceive, after many years of study, to be the best overall plan for the development of the entire 900 MHz allocation, and we find its submissions unpersuasive. Nothing in AT&T's current pleadings tend to undermine the balance between new service offerings and spectrum management and conservation struck in the Second Report and Order. Furthermore, AT&T has not adequately supported its assertions concerning systems changes which, although not without attractive features, would occupy more spectrum. For example, no information has been supplied on how the new cost figures were arrived at, on the comparative costs of the original and of the new design of the system, or on the technical or overall economic advantages of each system design. We cannot properly contemplate a substantial change in our allocation plan, worked out over a four-year period, on the basis of such unsupported statements. Accordingly, its request will be denied.

13. Motorola suggests we adopt a policy of phased assignments, not dissimilar from the plan established in the Second Report and Order. However, Motorola would begin with the minimum amount of radio spectrum necessary to establish a "cellular" system (i.e., 12.5 MHz), and would have us make additional spectrum available only when and as we determined, in further rulemaking proceedings, that additional spectrum were needed. This suggestion is rejected.

14. The allocation judgment reflected in the Second Report and Order is based on record evidence compiled in proceedings in which Motorola actively participated. This petition for reconsideration simply re-argues substantially the same issues[**] which were resolved in our Second Report and Order, supra. See, e.g., Pacifica Foundation, 17 Pike & Fischer, R.R. 2d 1073 (1969); WWIZ, Inc., 3 Pike and Fischer, R.R. 2d 316 (1964).

15. In its reconsideration petition, AT&T also recommended that the spacing between the cellular base and mobile frequency bands be increased to 48 MHz rather than the 45 MHz spacing adopted in the Second Report and Order. Forty-eight megahertz corresponds to eight television channels and would, according to AT&T, simplify frequency coordination with Canada where the 806–890 MHz band in allocated for television broadcasting.

16. AT&T's plan may offer some advantages in the border areas; however, considering the large number of planned Canadian television assignments using these frequencies and the fact that U.S. land mobile services will be operating in derrogation of international allocations, it will be difficult to coordinate any U.S. land mobile assignments along the border under either AT&Ts plan or the plan adopted in the Second Report and Order. Any meaningful coordination with Canada must await completion of that country's own long range studies of future television and land mobile requirements.

17. Thus AT&T's proposed frequency shift would have no immediate advantages and only problematical future ones in our coordination with Canada and Mexico. On the other hand, it would eliminate possible channel pairing in an additional 6 MHz of reserved land mobile spectrum. The usefulness of that reserve spectrum for future two-way services would thus be greatly reduced. This problem would affect the whole country, not just the border areas. Therefore, on balance, we must reject AT&T's proposal, and the allocation plan will remain as adopted in the Second Report and Order.

18. The General Electric Company, Major Appliances Business Group, has asked for reconsideration of the portion of the Second Report and Order dealing with the frequency provision for 915 MHz ISM (industrial, scientific and medical) devices. Our decision in that document was to reduce the frequency tolerance of such devices to ±13 MHz effective January 1, 1980. Throughout the proceeding, GE has stated that it will not be feasible to manufacture microwave ovens capable of meeting this narrower tolerance. In our decision, we indicated, among other things, our view that the new tolerance could indeed be feasibly met by 1980, and that if our basic objectives in this proceeding were to be achieved, such tolerances would have to be met. In its petition for reconsideration, GE reiterated that a practical oven could not be manufactured under the new tolerance by 1980, and that while it is willing to conduct research looking toward future reduction of the oven frequency tolerance, it could not justify spending money for such research or for further development and manufacturing of the 915 MHz ovens should the Commission adhere to the 1980 deadline. GE has requested that the 1980 cut-off date be replaced with a statement that the Commission will, in 1980, re-examine the desirability of imposing the narrower frequency tolerance, considering oven technology and other factors that exist at that time.

19. We conclude that the present regulations may be somewhat more restrictive than necessary to accomplish our immediate objectives. Accordingly, we recede to a recommendation made in an earlier General Electric filing as a more appropriate solution to this problem. In its "Additional Comments" of February 22, 1971, General Electric recommended a change in § 18.144 of our rules. This section describes the procedure to

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* The SMR systems are those to be licensed under the provisions of § 89.604(c) of our rules. These stations have been variously referred to as "multi-user systems," "multiple user systems," and "common user systems." It appears that, because of this profusion of names, there exists some confusion concerning the definition of the SMR category. To clarify: under this category we will license base station facilities and make their use available (under certain restrictions and limitations) to persons eligible in the Public Safety, Industrial and Land Transportation Radio Services. The SMR system licensee may, in turn, make these facilities available to either an eligible individual or to a number of eligible individuals in one or more of the service groupings set out at §§ 89.801 and 89.802 of the rules.

** For example, we decided in the Second Report and Order that licensees of cellular systems will be authorized to offer "radiotelephone" service to the public as well as limited "dispatch" service. Motorola now argues that any assignment of spectrum to cellular systems, beyond the initial 12.5 MHz, should be based solely on the need shown for "radiotelephone" requirements, but not on any "dispatch" requirements. The question whether "cellular" systems should provide dispatch service was a controversial one; Motorola has offered nothing not previously considered; accordingly, its petition for reconsideration must be denied.

be used for type approving microwave ovens. The current procedure requires "(t)hat the frequency at all times during the tests . . . shall be maintained within 70 percent of the tolerance specified in § 18.141(a)." The tolerance in § 18.141 (a) is ±13 MHz for ISM devices designed to operate at 915 MHz.[11] In its 1971 filing, General Electric requested that this testing procedure be changed so that the ovens could operate within the entire ±13 MHz tolerance. We will accept this suggestion.

20. Requiring ovens to remain within 70 percent of the tolerance is more restrictive than appears to us, on further reflection, necessary to protect future, yet-undetermined operations in the adjacent bands. Section 18.144(b)(1) will therefore be modified accordingly. Footnote US 215 to the Allocation Table is therefore amended to remove the provision which would allow ISM devices to make use of the 928–940 MHz band until 1980.[12] We are therefore establishing, effective immediately rather than in 1980, the ± 13 MHz tolerance for 915 MHz ISM devices (which conforms to the ITU standard), by relaxing the testing procedure used in type approving these devices. These changes should remove the problem raised by GE and enable the continued manufacturing of 915 MHz microwave ovens. This relaxed testing procedure increases the probability of interference to future communications services operating adjacent to the ±13 MHz ISM frequency tolerance. It may be necessary to re-examine the need for tighter standards on 915 MHz ISM devices in the future when specific allocations to radio services in the adjacent bands are proposed.[13]

Policies related to cellular systems. 21. A number of parties requested reconsideration of certain policies relating to cellular communications systems. These petitions will be dealt with below.

22. GTE Service Corporation (GTESC), American Telephone and Telegraph Co. (AT&T), and the United States Independent Telephone Association (USITA) took exception to our requirement that wireline telephone companies establish separate operating companies, books of account and personnel for the operation of cellular systems. GTESC contends that "maximum separation" of cellular and other telephone company operations is counter-productive and not factually justified. It characterizes the basis for such separation as the equalization of competitors' positions, a policy which is said to violate the principles of Hawaiian Telephone Co. v. FCC, 498 F.2d 771 (D.C. Cir. 1974). USITA advances this view also, and argues in addition that cross-subsidy is not so difficult to identify or control that separate corporations are necessary. AT&T argues that the record in this docket does not support the separate corporation requirement and that such a policy could be reasonable only as a response to certain contingencies in the operation of cellular systems—contingencies which may never develop. AT&T also argues that the requirement represents a regulatory "handicap" which has proved counter-productive in other contexts; that it may make cellular service needlessly more costly by interfering with the "efficiencies and economies" belonging to the existing wireline structure; and that cross-subsidy can be avoided by other, less drastic means. Motorola, Inc., by contrast, argues that the separate corporation requirement is necessary if wireline companies are to enter the dispatch communications field and that the carriers have failed to demonstrate what efficiencies will be lost through such separation.

23. We have carefully considered the arguments advanced by each party with respect to the separate corporation requirement and find them largely unpersuasive. First, the separation requirement is inapplicable to the developmental stage. The risk that development will be retarded, we find, is acceptably small in view of the evil sought to be avoided. Second, our reprehension of cross-subsidy is not grounded solely on the competitive evils we believe it may cause, as arguments based on "Competitive Equalization" or on the Hawaiian Telephone case seem to assume. We are also concerned with consumers of the carriers' other services as well. If these other services are generating sufficient surplus revenues to subsidize a new offering at noncompensatory rates, consumers of existing services may be paying unreasonably high rates for them. We find that the requirement of corporate separation will significantly reduce the risk of cross-subsidy and, in addition, will make our supervision of this field's development much simpler and more effective. For this reason, we reject the petitions that we remove this requirement. We will, however, closely monitor the operation of the developmental systems (as to which no separation requirement has been imposed) in order to determine whether means less costly than actual separation exist, with respect to one or more carriers, to accomplish our policy objectives. Further submissions and suggestions may be presented in this connection at appropriate times.

24. A number of parties requested reconsideration of our policy against wireline carriers manufacturing, providing or maintaining cellular mobile equipment. GTESC contends that the prohibition is without record support and that it is premature and should be removed pending experience with the developmental phase. USITA believes that the prohibition will adversely affect the quality of service provided by cellular carriers and that each subscriber should have the option of obtaining equipment and service from the telephone company. AT&T expresses concern that a lack of initial availability of cellular mobile equipment and service from outside sources may reduce the practical availability of cellular service. It states that the user should be able to choose his supplier, equipment and service. Finally, AT&T submits that the prohibition should be modified at least to permit continued use of equipment in service during the developmental period. The Magnovox Company opposes the prohibition on maintenance and supply. It submits that the removal of this restriction would result in increased opportunities for mobile equipment suppliers given the present concentrated structure of the mobile equipment industry. The California Mobile Radio Association (CMRA) and Motorola contend, on the contrary, that continuation of the present structures would be procompetitive; that there will be no shortage of equipment given the numerous radio equipment suppliers that exist in the markets where cellular systems are likely to be installed initially. Further, Motorola says that use of independently manufactured equipment in developmental systems would avoid having to scrap developmental equipment once the system began regular operation.

25. We have concluded that supply and maintenance of equipment may be a limiting factor, particularly during the beginning period of system operation. Therefore: (1) carriers will be allowed to supply and maintain mobile equipment manufactured by others; (2) to avoid waste, we will not automatically bar the continued operational use by carriers or users of carrier-manufactured equipment actually in use in the developmental system, but will entertain applications to continue the use of such facilities in accordance with normal procedures for section 214 or other authorizations; (3) finally, we reaffirm our decision that the cellular operators may not manufacture mobile equipment for use in their cellular systems except for equipment used in the developmental system.[14]

26. Several questions were raised regarding the offering of dispatch service on cellular systems. Motorola and Airsignal International believe that the Commission should make clear that dispatch service is strictly ancillary to primary mobile telephone service. Motorola also contends that the intermingling of dispatch and telephone services lessens the efficiency of the cellular system and increases the cost to the user. Airsignal suggests that RCCs providing dispatch services in cellular markets be allowed a five-year head start.[15] CMRA submits

[11] Footnote 2 in both § 18.13 and § 18.141 states conditions in effect pending the outcome of Docket No. 18262. The deletion of these notes was inadvertently omitted in the Second Report and Order. We are deleting them at this time.

[12] The new version of US 215 appears in the attached Appendix.

[13] We also point out that the Commission's rules and regulations contain a general provision in § 18.17 which requires the operators of ISM devices to remedy any harmful interference which may be caused by those devices to authorized services operating outside the legal ISM tolerance.

[14] Only that limited class of carrier-manufactured equipment may under any circumstances be offered to customers after the system begins regular operation.

[15] Airsignal also desires that wireline companies proposing to operate cellular systems be required to phase out the offering of paging services. The offering of paging services is not before the Commission in this proceeding.

that the wireline carriers should be severely restricted or prohibited altogether from offering dispatch service. AT&T contends that dispatch service is fundamental to the cellular concept and that a system serving both dispatch and mobile telephone users is more efficient.

27. Nothing in these submissions persuades us that the disposition of these matters embodied in the Second Report and Order should be modified. Accordingly, we stand by our previous decision to allow dispatch and cellular systems to be intermingled.[26]

28. Airsignal International, Inc. (Airsignal) has questioned our decision that only wireline carriers be licensed to operate cellular systems. Airsignal argues that this policy is unwise, because it effectively vests another monopoly in AT&T, and that it is not supported by the evidence, because it turns on the (unfounded) assumption that no other entity possesses the necessary resources, financial and otherwise, to proceed with cellular systems even on a limited developmental basis. Airsignal points out that if the Commission's factual conclusion is correct, then our policy conclusion is unnecessary, and concludes that, separately or as a member of a consortium, it would be willing and able to test and develop a cellular system in a fair competitive environment. AT&T in reply recapitulates and endorses the Commission's decision.

29. Our basic objective in allocating the 40 MHz of radio spectrum in the 900 MHz region is to accommodate the present and future requirements of the public for radiotelephone and limited radio dispatch services through an integrated, broadband, and fully interconnected radio communication system. In our Second Report and Order, we concluded, first, that a "systems" approach to frequency allocations would best achieve our objectives and, second, that cellular system technology would be the best way to meet the potentially large future requirements for public mobile radiotelephone and limited dispatch service. These basic determinations have not been seriously challenged by the petitioners. But the question has been raised whether we should rely exclusively on wireline communication carriers for the development and operation of these systmes.

30. In the Second Report and Order, we found that wireline carriers were the only organizations which demonstrably had the resources and expertise necessary to establish "cellular" radio systems on a nationwide scale. Indeed, AT&T was alone in submitting comprehensive proposals for developing and implementing such systems. Nevertheless, we must concede the logic of Airsignal's argument that if we were correct that the wireline carriers were the only ones capable of cellular service offerings, then giving them exclusivity in this service would be superfluous. Accordingly, the restriction on eligibility contained in Paragraph I of Appendix C to the Second Report and Order will be removed so that any qualified entity, in addition to wireline carriers, will be permitted to apply for authorizations to develop and eventually to operate cellular radio systems of the type to be authorized under our rules. By expanding eligibility for cellular systems we do not, we emphasize, modify our basic decision to rely on cellular technology for the development of mobile radiotelephone service at 900 MHz. We will not consider any application for frequencies within the 40 MHz allocation in the Domestic Public Radio Service unless a cellular system is proposed.

31. Although cellular systems research has been developed to advanced stages by AT&T, considerable additional work must be done before standards may be prescribed for such systems on a regular basis, especially standards which would assure compatibility nationally. Therefore, as we announced in the Second Report and Order, until further order, only developmental cellular systems would be authorized. The total number of such developmental systems will be limited, of course, by our conclusion to authorize only one developmental cellular system in any market or service area; but the precise number we will authorize will depend on the overall progress of the developmental program. Following that program, we will adopt standards to which all systems, existing and new, will be required to conform. It must be especially emphasized that the granting of a developmental authorization cannot form the basis of any reliance concerning whether a regular authorization will be granted. Any grant for regular authorization will require the licensee to comply with such standards as we may adopt. When rules permitting regular operation are adopted, applications for conforming operational cellular systems will be considered on a case-by-case basis. If two or more qualified applicants apply for authorization to provide service to the same area, we will decide between them on the basis of a comparative hearing. Ashbacker Radio Corp. v. Federal Communications Commission, 326 U.S. 327 (1945).

32. As with developmental systems, then, we plan to authorize, on a regular basis, only a single system to serve a given market or area. At the same time we recognize that cellular systems as we envision them may not prove to be economically feasible in all markets, particularly the smallest one. For this reason, we may find it appropriate at some future time to consider alternatives systems and licensing policies applicable to these markets, including the feasibility of more than one system per area. In this connection, we realize that our decision to allow competing applications for cellular facilities may create the possibility for significant delays in the implementation of "cellular" radiotelephone service, delays inherent in the comparative process. In this regard, being mindful of the past difficulties we have experienced, we find it necessary to guard against them to the extent that it is possible to do so. Accordingly, it will be important that all proposals for regular cellular operation meet standards which will assure us that the proposed facilities can be, and will be, constructed and will be placed in operation within the time limits we will prescribe and that the processes for comparative consideration will not be abused. Accordingly, we plan to apply the same definitive threshold qualification standards for acceptance of applications for cellular systems on a regular basis as we have prescribed for developmental applications; for considering objections to cellular proposals; and for any comparative evaluation of competing applications. These will be designed to assure that our public interest objectives we have set for ourselves in allocating radio spectrum for the cellular radiotelephone and limited dispatch service are achieved on as expeditious a basis as possible.

33. Applicants for developmental authorizations must, at a minimum, propose a radio system consisting of the following: The system must utilize a bona fide cellular configuration of base station transmitters and receivers to cover the proposed service area.[27] Base station transmitters must radiate no more radio frequency power than required to adequately cover each cell. Base stations must be connected together through a common switching and control point using wirelines. The radio system must be fully inter-connected with the public landline telephone network and be capable of providing a grade of service comparable to that of the landline system. Narrow band frequency modulation must be employed for all voice channels in the radio system, and each radio frequency channel must not exceed 40 kHz of authorized bandwidth. Radio frequency channels employed within each cell must be trunked for greater spectrum efficiency. While no more than 12.5 MHz will be authorized initially, a developmental cellular system must be capable of expanding to use the full 40 MHz, if required to satisfy the demand in the proposed service area. In major metropolitan areas the developmental system must have the potential for orderly evolution into a highly efficient small-cell configuration capable of handling a large number of subscribers within the allocated 40 MHz of spectrum.

34. Applicants for developmental systems will be required to submit a detailed program for constructing, developing and operating the proposed system, including a description of the technical and operational standards to be tested or to be developed and of the objectives to be achieved. The proposal must also include the applicant's time schedule for con-

[26] We also stand by our original determination in connection with "fleet-call" automatic dispatch service offerings. See Second Report and Order, paragraph 25.

[27] Further to clarify: in a cellular system, each "cell" is an identifiable geographic compartment within the system. Given radio frequencies are used in one cell and are re-used in a non-adjacent cell in some other part of the system. Only a fraction of the assigned radio channels are used in any one cell.

structing the developmental system, for placing it in operation, and for developing it into a fully operational prototype. Further, since the applicant's financial as well as technical qualifications are particularly important here, the costs of the proposed system at the various stages of its development must be stated, and it must clearly be shown how the applicant proposes to finance the construction and operation of the system during the period of the authorization. The applicant's technical capability to design, construct and operate the proposed system must be shown, including a description of the nature and extent of the engineering facilities which the applicant has available for this purpose. In brief, it should be understood that highly complex systems of this kind will require considerable financial resources as well as technical expertise. Therefore, applicants should be prepared to make a convincing showing that they have the ability to establish a sound developmental program and that their program will make a substantial and unique technological contribution, looking toward establishing standards for a compatible nationwide system. It must be stressed that our decision to allow applications to be submitted by other than wireline carriers does not imply, and should not be taken to signal, any slackening of our view that the public interest requires that development of cellular systems be carried forward as swiftly as possible. It is vital that the frequency spectrum made available for this purpose be put to use without delay in order to serve the public needs for mobile radiotelephone and for limited dispatch service. There must be prescribed time limits within which an applicant who has received a developmental grant will carry out the proposal. Applications must include a proposed time schedule that must, at a minimum, call for beginning construction within one year following the grant and for completion of the developmental operation no later than January 1, 1979. We would expect to have adopted definitive technical standards and other regulations for regular cellular system operation by that date. We will monitor the developmental program closely and will require licensees to supply progress reports periodically to ensure that the developmental program is progressing in accordance with the applicant's representations set out in his original proposal.

35. The independent wireline common carrier industry requested that the Second Report and Order be clarified or interpreted to permit a coordinated or integrated cellular system by wireline carriers in a given area when the communication market is served by more than one telephone company. It is unnecessary to rule finally on this request, and in any case the record evidence is inadequate to permit us to decide it properly. As noted above, the Commission will closely monitor the operation of the developmental systems. A final determination of the independents' request can more satisfactorily be made on the basis of whatever information we gather through this monitoring or from other sources during the intervening period.

Issues relating to the 30-MHz allocation for the public safety, industrial and land transportation radio services; issue raised concerning specialized mobile radio system. 36. The decision to license SMR systems was taken in light of the many comments and proposals put forward in this Docket by written pleadings[18] and in oral argument before the Commission en banc. Under this aspect of our licensing plan, entrepreneurs were to be authorized to make radio facilities available for use by individuals defined as "eligible" in Parts 89, 91 and 93 of the rules.[19] This was an important additional option for eligibles in these services. Up to then, the alternatives had been individual licensing and sharing systems under established "cooperative" and "multiple licensing" practices.

37. It was decided that SMR systems could be used to best advantage by adhering to the regulatory philosophy followed in the Safety and Special Radio Services. Accordingly, we carried over the detailed standards for eligibility, and adopted standards for channel loading, for permissible powers and antenna heights, and for station separations. In addition, we specified the types of systems we would permit, namely, "trunked" and "conventional." Further, we included statements of the policies and practices to be followed in assigning frequencies and in licensing stations for operation in the 900–MHz band. In short, all of the conditions under which radio systems would be authorized in the 900–MHz band were incorporated with great specificity in our new rules.

38. The decision to assimilate SMR systems into the Safety and Special Radio Services scheme of regulation has the following implications. SMR systems will be regulated in accordance with procedures followed in the Safety and Special Radio Services and protests based on economic grounds or "need" will not be entertained. Instead, SMR systems will operate under the same competitive conditions that prevail in the private dispatch market. Moreover, although we would pass upon the legal, the technical, and the other qualifications of applicants for facilities of this kind, we plan not to examine the financial qualifications of each applicant separately. Instead, we will ensure their performance as licensees through mandatory construction and loading requirements. And finally, applications for SMR systems will be processed with all other 900–MHz proposals essentially in the order in which they are received.

39. Our decision to authorize SMR systems in the Public Safety, Industrial and Land Transportation Radio Services has been challenged by communications common carriers (i.e., AT&T and the so-called RCC's) essentially on the theory that, as a matter of law, SMR systems must be regulated as common carriers. This issue has become the most controversial one we have had to resolve in this rulemaking. We acknowledge that the matter is not free from doubt; but we rely on the latitude to which, as an expert agency, we are entitled in "copying with new developments" in "a dynamic industry." Philadelphia Television Broadcasting Co. v. FCC, 123 U.S. App. D.C. 298, 300, 359, F.2d 282, 284 (D.C. Cir. 1966).

40. The contentions of the communications common carriers have been subject to unusually thorough consideration by the Commission at every level. We now discuss the most important of these contentions. First, it is argued that SMR systems are, by definition, "common carrier" operations and, therefore, that Title II of the Communications Act requires us to regulate them as common carriers. Second, it is argued that Sections 2(b) and 221(b) of the Act[20] reserve to the states the power to regulate "radio common carriers," and that we have no authority to adopt a non-common carrier type regulatory approach for licensing such operations. Third, it is asserted that the plan for licensing SMR systems is inconsistent with the hearing provisions of Section 309 of the Act and with the Ashbacker doctrine.[21] Fourth, it is said

[18] As stated, SMR system licensing was the subject of much comment by interested parties. Among those commenting were: manufacturers (e.g., Motorola and GE); industry and other associations (e.g., National Association of Regulatory Utility Commissions, National Association of Business and Educational Radio, Inc., National Association of Radiotelephone Systems); and government agencies (e.g., Office of Telecommunications Policy and the Department of Justice).

[19] While the Second Report and Order regulatory scheme provided for "trunked" radiotelephone service, this feature is no longer a part of the plan; and we will make no further reference to it.

[20] Sections 2(b) and 221(b) were amended in 1954. See H. Rept. No. 910, 83d Cong., 1st Sess., 1953, accompanying H.R. 6436; and S. Rept. No. 1090, 83d Cong., 2d Sess., 1954, accompanying H.R. 6436. The cases cited and reviewed are, in part, cited in the text and listed at Appendices C and D, filed as part of the original document.

[21] Ashbacker Radio Corporation v. Federal Communications Commission, 326 U.S. 327 (1945). Also, a number of parties have asked that we reconsider our decision to license SMR systems in the Public Safety, Industrial, and Land Transportation Radio Services; and that we set it aside and conduct an evidentiary hearing before the Commission en blanc. This point may be disposed of summarily. We conclude that such further proceedings are neither required nor would they be helpful. It is clear that the rulemaking proceedings we have conducted were the appropriate vehicles for resolving the issues. This, of course, is basically an allocation proceeding with associated policy matters of general and future applicability. (See pertinent authorities: Sections 4 (i) and (j), and 303(r) of the Communications Act. Securities and Exchange Commission v. Chenery Corporation, 332 U.S. 194 (1947); Federal Communications Commission v. Pottsville Broadcasting Co., 309 U.S. 134 (1940); National Broadcasting Co., Inc., et al. v. United States et al., 319 U.S. 190 (1942); American Trucking Association v. United States, 344 U.S. 298 (1953); United States v. Storer Broadcasting Co., 351 U.S. 192 (1955); Federal Power Commission v. Texaco,

that our plan is contrary to Section 308 which requires consideration of financial, legal, technical and other qualifications of each applicant on an ad hoc basis. Fifth, it is argued that we have substituted a scheme of "no regulation" in a utility field where regulation—by virtue of the nature of the service to be provided—is required. In such circumstances, it is contended, it is not enough to say that the "common carrier" approach to licensing is inappropriate, because that determination is inherent in the Communications Act itself. Hence, assuming the common carrier approach to be inappropriate, the remedy is not through rulemaking, but through amendment of the Communications Act.

41. Finally, it is contended that regulation of the SMR systems as planned is contrary to the public interest. This is so, it is urged, because the new approach will lead to destructive competition between regulated and non-regulated business enterprises, both offering the same types of services. The result will be the loss of important and valuable services now provided through radio common carriers. This aspect of the case alone, it is argued, is of great importance and, as a minimum, requires careful evaluation of all pertinent considerations in a separate rule-making proceeding.

42. The core legal question is whether the Commission has legal authority to follow the regulatory approach adopted for SMR systems. In finding that we have such authority, we have taken account of both the language of the statute and the regulatory goals we hope to attain. It is our conclusion, based on forty years of spectrum management, that the public interest cannot adequately be served by the allocation of additional radio frequencies to the land mobile radio services except by the regulatory approach outlined herein for the SMR systems. See paragraphs 51–78. We do not regard the statute as necessarily inconsistent with these findings. "In a statutory scheme in which Congress has given an agency various bases of jurisdiction and various tools with which to protect the public interest, the agency is entitled to some leeway in choosing which jurisdictional base and which regulatory tools will be most effective in advancing the Congressional objective." Philadelphia Television Broadcasting Co. v. FCC, 123 U.S. App. D.C. 298, 300, 359 F. 2d 282, 284 (D.C. Cir 1966). As we make clear in paragraphs 51–78, infra, the public interest considerations pointing to the approach we have taken in the SMR system regulation are unusually obvious.

43. SMR systems and radio common carriers are undeniably similar from a physical standpoint: the engineering specifications each employs, for example, are for practical purposes identical. But that fact need not detain us. Every different form of radio communication, in every part of the electromagnetic spectrum, is similar to every other form in one degree or another. The differences in the regulatory constraints applicable to each are explained with reference to the distinctive purposes we intend each to serve. Radio common carriage has essentially functioned to extend public telephone service to moving vehicles: in order to meet this service objective, the Commission has thought it best to impose no restrictions on eligibility as to users, nor on the length or content of messages. SMR systems, on the other hand, are meant to have a fundamentally different application. These may only be licensed to provide base station facilities for "dispatch" service. Unlike common carrier services, dispatch systems are not necessarily interconnected with the telephone system, rather, they are usually designed to meet the internal business requirements of their users—the dispatch of taxicabs or service vehicles, for example. Rules limit what users are eligible for this class of service: and, consistent with its different intended functions, users in fact employ such systems very differently from how common carrier systems are used. Communications on such systems are ordinarily very abbreviated, or even coded, to allow for the maximum possible transmission of information in a given period of time.[*]

44. The Communications Act, viewed as a whole, gives us the authority to authorize and to regulate SMR systems in the manner described above. See sections 1, 4 (i) and (j) and sections 301 and 303 of the Act; see also National Broadcasting Co. v. United States, 319 U.S. 190 (1942); United States v. Southwestern Cable Co., et al., 392 U.S. 157 (1968); and Philadelphia Television Broadcasting Co. v. Federal Communications Commission, 123 U.S. App. D.C. 298, 359 F.2d 282 (1966). We fully appreciate our responsibility to exercise our authority in a way that is "not inconsistent" with the statute. See, for example, Sections 4(i) and 303(r). If we were to conclude that SMR systems should be considered interstate common carriers in the ordinary sense, within the meaning of Section 3(h) of the Act, our regulatory plan would be designed to assure, for example, that the rates charged were "just and reasonable." See section 201(b) of the Act; see also Federal Power Commission v. Texaco, Inc., 417 U.S. 380 (1974). Further, if we had concluded that they were intrastate common carriers or intrastate "telephone exchanges" within the meaning of sections 2(b) or 221(b) of the Act, a different regulatory approach would clearly have been required.

45. In summary, we view SMR systems as a new class of station to be licensed in the Public Safety, Industrial and Land Transportation Radio Services, where, we have said, licensees are properly not

Inc., 377 U.S. 33 (1964); Air Line Pilots Association International v. Quesada, 276 F. 2d 892 (2d Cir., 1960); Lafayette Radio Electronics Corporation v. United States, 345 F. 2d 278 (2d Cir., 1964); WBEN, Inc., v. United States, 396 F. 2d 601 (2d Cir., 1968); and Washington Utilities & Transportation Commission et al. v. Federal Communications Commission et al., Case Nos. 71–2919 and 72–1193, United States Court of Appeals, 9th Cir., 1975, January 20, 1975, affirming Specialized Common Carrier Services, 29 FCC 2d 870 (1971). See also: Philadelphia Television Broadcasting Co. v. Federal Communications Commission, supra; Mansfield Journal Co. v. Federal Communications Commission, 86 U.S. App. D.C. 102, 180 F. 2d 28 (1950); Peoples Broadcasting Co. v. United States, 93 U.S. App. D.C. 78, 209 F. 2d 286 (1953); Logansport Broadcasting Corp. v. United States et al., 93 U.S. App. D.C. 342, 210 F.2d 24 (1954); Zenith Radio Corp. v. Federal Communications Commission, 93 U.S. App. D.C. 284, 211 F. 2d 629 (1954); WIRL Television Co. v. United States, 102 U.S. App. D.C. 341, 253 F. 2d 863 (1958); Owensboro on the Air v. United States, 104 U.S. App. D.C. 391, 262 F. 2d 702 (1959); Metropolitan Television Co. v. Federal Communications Commission, 110 U.S. App. D.C. 133, 289 F. 2d 753 (1964); and GTE Service Corporation v. Federal Communications Commission, 474 F. 2d 724, 730–732 (2d Cir. 1973)). Where rule-making procedures of the kind we have employed in this case permit a sound evaluation and determination of policy to guide the future development of the industry and are also conducive to a prompt, orderly and efficient disposition of the matters in issue, we meet our statutory responsibilities by choosing the procedure most suitable to a resolution of the kind of issue before us. (See Specialized Common Carrier Services, supra, at p. 900; and Washington Utilities & Transportation Commission case, supra, affirming Specialized Common Carrier Services case.) All participants have been accorded a full opportunity to present their views and arguments on the SMR system issue. We have considered all material aspects of this question in great detail, and we find from our review of this material that there would be no public benefit to be derived from a further examination in an evidentiary hearing of what is basically a policy decision. The mere circumstances that an issue may be the subject of controversy does not require its resolution through an evidentiary or adjudicatory process. Neither the Communications Act, nor the Administrative Procedure Act requires this, neither does case precedent. In short, all parties have been accorded due process of law. More is not required. (See Buckeye Cablevision, Inc. v. Federal Communications Commission, 128 U.S. App. D.C. 262, 387 F.2d 220 (1967); Coastal Bend Television Co. v. Federal Communications Commission, 91 U.S. App. D.C. 251, F. 2d 686 (1956); and cases cited this fn., supra.)

[*] Under our revised licensing procedures, the user of SMR systems will be licensed directly by the Commission for those parts of the system he is to use exclusively (e.g., control stations and mobile units). This system of supervision will enable us to ensure that each user is actually eligible and that the facilities are employed for permissible purposes and are otherwise being operated in compliance with the specific restrictions and limitations that have been imposed. In our view, SMR systems are an additional option by which eligibles in the Public Safety, Industrial and Land Transportation Radio Services may obtain the physical facilities necessary to make use of the radio frequencies that have been made available for their specialized radio communication requirements. In keeping with its nature and purpose, SMR system operation is to be subject to the same governing restrictions and limitations applicable to other operations in the Public Safety, Industrial and Land Transportation Radio Services, and SMR facilities are to be made available under the same marketing practices under which licensees in these services now provide themselves with the radio gear they need. In short, SMR systems are to be an integral part of the existing Public Safety, Industrial and Land Transportation Radio Services.

subject to traditional common-carrier-type regulation. Our authority to establish this new class of station derives from sections 303 (a) and (b) of the Act. As discussed more fully infra, at paragraphs 62–78, we have found on the basis of the record before us that competition, and only competition, will assure that the radio frequencies allocated herein will be best utilized in the public interest. The petitioners' argument that we have substituted a "no regulation" scheme for regulation must accordingly be rejected.

46. We have also concluded that our new rules do not violate the provisions of the Act nor the principle of Ashbacker.[23] In meeting our obligations under section 308(b),[24] all of the requirements for obtaining a radio station authorization have been spelled out in detail in the rules.[25] Each application will be examined to determine if the proposal meets minimum legal and character qualifications, as well as technical, operational, frequency loading, and other requirements. However, the new rules do not require an applicant to show that he has the financial qualifications to construct the proposed facilities. Instead, licensees of "trunked" SMR systems, for example, will be required to begin construction of the authorized facilities within six months of authorization and to complete construction within one year. Further, the licensee must "load" his facility in accordance with express standards set out in the new rules. If he does not, the frequencies assigned, or some of them, will be made available for use by other eligible persons. This method, in our view, is preferable to the examination of a financial statement to ensure that the frequencies assigned will be used effectively. The Communications Act gives us ample flexibility in this area to adopt measures most conducive "* * * to the proper dispatch of [our] business and to the ends of justice." Section 4(j) of the Act. See Federal Communications Commission v. Pottsville Broadcasting Co., 309 U.S. 134 (1940).

47. As to Section 309, the carriers contend that the Second Report and Order improperly failed to provide for "public notice" of the filing of SMR applications and related procedures set forth in Section 309 (b) and (d). The statute, itself, does not require this in the Safety and Special Services, except in certain situations not pertinent here.[26] However, interested parties will be given notice in accordance with the practices and procedures followed in Public Safety, Industrial, and Land Transportation Radio Services.

48. The carriers also seem to argue that the Second Report and Order unlawfully circumscribes section 309 petition to deny and hearing rights. In this respect, we wish to clarify that our previous decision only announced that petitions to deny and adjudicatory hearings on questions of "need" or "economic exclusivity" would not be entertained. While we have no doubt that hearings may be ordered where substantial and material questions of fact are presented, or where we find ourselves unable to determine that the public interest, convenience, and necessity would be served by the grant of a particular application, we believe that we have the authority to anticipate and to resolve expected recurrent issues of broad policy nature on an overall basis and thus obviate the need for subsequent ad hoc determination of similar issues through the adjudicatory hearing process. This is also the approach we followed in resolving substantially similar issues in Specialized Common Carrier Services, 29 FCC 2d 870 (1971). See in particular, pp. 896–903 and 921–927.[27] As we pointed out in that case, the statutory standard governing our consideration of all applications, under Section 309, is whether a grant would serve the public interest and this standard must be applied in the context of the overall objectives of the statute expressed in sections 1 and 301 of the Act. In our Second Report and Order, we determined that the statutory objectives would best be achieved and the public interest would be served best by authorizing SMR systems on an open entry, competitive basis and, in view of that determination, we believe that we properly concluded that it would not be necessary to consider anew, on a case-by-case basis, questions relating to the need of a proposed new system or its economic impact, if any, on existing systems. We think this is a permissible approach to the resolution of an overall policy issue, and it is consistent with the scope of the provisions of section 309. Specialized Common Carrier Services case, supra.

49. The actions in this and in previous proceedings allocating a substantial amount of additional radio spectrum to the Public Safety, Industrial, and Land Transportation Radio Services were based on our determination, in this and in previous proceedings and studies conducted over more than a ten-year period, that there are very substantial, unsatisfied requirements for land mobile communications in these specialized radio services, and that those requirements will continue and will grow further in the foreseeable future.[28] Our overall plan for accommodating these requirements, adopted in the Second Report and Order, includes a regulatory approach which permits the operation of a free, competitive market, including free entry, as the best method for developing the new system designs, new technology, and new marketing techniques which we felt were necessary for the fuller development of the new spectrum. Also, for reasons further explained in a subsequent section in this opinion, we have determined that competition, including free entry, is feasible in that the nature and the size of the market and the radio spectrum resources will support multiple and competing systems; that it is consistent with competitive marketing practices traditionally followed in these services; and that it will benefit the users. In view of these findings, re-evaluating questions of "need" or "economic impact" through the adjudicatory process would be inconsistent with our overall plan and objectives and, therefore, it would be highly inappropriate.

50. On the question raised concerning the Ashbacker doctrine, we would observe that it applies only where there are two or more applications and where all cannot be granted because of interference or other considerations, i.e., when they are "mutually exclusive" with one another. Whether such situations will exist at 900 MHz is not known; but we are confident that it is highly unlikely. This is not perchance, rather it is because we have allocated sufficient frequencies, 30 MHz plus reserves, to accommodate expected demand. However, should the situation arise where we cannot grant all applications, in accordance with applicable law, hearings will be held, obviously. The Second Report and Order so states. Accordingly, we see Ashbacker as no bar to the implementation of our plan; and in view of these considerations, we believe that the regulatory plan adopted in the Second Report and Order for SMR systems complies with all case law and statutory requirements.

The public interest considerations in licensing SMR systems. 51. We now discuss the public interest considerations involved in our decision to license SMR systems in the Public Safety, Industrial and Land Transportation Radio Services and to regulate them in the manner we have described. The reasons for our decision and the objectives we seek to achieve can be best explained if we summarize the historical context in which that decision was made.

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[23] Op. cit., supra, fn. 17.

[24] Section 308(b), in pertinent part, reads: All applications for station licenses, or modifications or renewals thereof, shall set forth such facts as the Commission by regulation may prescribe as to the citizenship, character, and financial, technical, and other qualifications of the applicant to operate the station; the ownership and location of the proposed station and of the stations, if any, with which it is proposed to communicate; the frequencies and the power desired to be used; the hours of the day or other periods of time during which it is proposed to operate the station; the purposes for which the station is to be used; and such other information as it may require.

[25] See Land Mobile Radio Service, supra, fn. 2, at Appendix B, together with Appendix B, attached hereto.

[26] See 47 U.S.C. section 309(b) and 47 CFR § 1.962.

[27] Our decision in the Specialized Common Carrier Services case was affirmed in Washington Utilities and Transportation Commission et al. v. Federal Communications Commission, et al., Case Nos. 71–2919 and 72–1193, United States Court of Appeals, 9th Cir., January 20, 1975.

[28] Frequency Allocation in 450–470 Mc/s Band, Second Report and Order, Docket No. 13847, 11 FCC 2d 648 (1968); Land Mobile Use of TV Channels 14 through 20, First Report and Order, Docket 18261, 23 FCC 2d 325, 327–339 (1970); Frequency Allocation in the Band 806–960 MHz, First Report and Order and Second Notice of Inquiry, 35 F.R. 8644 (June 4, 1970), at paras. 5 through 9. For other studies relating to the question of land mobile frequency requirements, see Land Mobile Use of TV Channels 14 through 20, supra., this fn., at fn. 3, p. 326.

Background. 52. Private land mobile radio systems had been in existence for many years—indeed, some antedated the creation of the Commission [20]—when the Public Safety, Industrial and Land Transportation Radio Services were established on a regular basis following a series of lengthy hearings in the late 1940's. General Mobile Radio Service, 13 FCC 1190 (1949). At that time we decided, among other things, that the public interest would be served by allocating a part of the radio spectrum to meet some of the specialized needs of local government and private industrial and transportation enterprises. For this purpose, we established the Public Safety, Industrial and Land Transportation Radio Services. We also allocated radio frequencies to serve the mobile radio communication needs of the general public, and for this purpose we created the Domestic Public Radio Services; and, as to this service, a different regulatory approach was adopted.[20]

53. One of the important aspects of the General Mobile decision was our determination that certain activities of local governments—i.e., police and fire protection—and of industrial and transportation enterprises could be facilitated by the use of radio. We found that making radio available for these purposes results, e.g., in improved police and fire protection, safer and more efficient railroad service, more reliable electric utility service, and safer and more effective petroleum exploration and production. Accordingly, we allocated approximately 40 MHz of radio spectrum for these purposes.

54. The regulatory approach adopted was relatively simple. First, we established specific radio services, e.g., the Police Radio Service; the Fire Radio Service; and the Petroleum, Power, Railroad and Motor Carrier Radio Services, among others. We then developed strict criteria to govern eligibility and use; and we also placed limits on permissible methods of operation. Further, to assure efficient use of the spectrum allocated, we adopted what were at the time advanced technical standards.

55. In addition, the frequencies were made available in "blocks," that is, certain groups of frequencies were designated for the exclusive use of eligibles in a particular radio service. In short, all the criteria for licensing radio systems and for their use were set out in detail in these regulations. Application processing could be carried out quickly because all of the norms and policies governing the licensing of stations in these services had been worked out in advance through our rulemaking processes.

56. This regulatory method proved extremely successful; and undoubtedly facilitated the rapid growth of radio communication in Public Safety, Industrial and Land Transportation Radio Services.[21] Further, land mobile communication systems developed into indispensable aspects of the public safety, industrial, transportation, and commercial activities of this nation.[22]

57. The growth of these specialized services placed a greater-than-anticipated demand on the radio spectrum allocated to them; and while we made determined efforts to satisfy the growing needs for land mobile facilities through more intensive use of the available spectrum,[23] we recognized that additional radio spectrum would eventually be required. There followed a 15-year period of examination and study of varying proposals to determine the nature and extent of the existing and future requirements of the land mobile radio services and how these requirements could best be accommodated.[24]

58. As a result of these efforts, we decided first to allocate additional spectrum and second to develop ways and means for improving spectral efficiencies through more effective management of the spectrum and through a "systems approach" which would take advantage of the advances in technology and permit spectrum economies which had not been possible in the past. Thus, in our decisions in this rule making and in the companion proceeding in Docket No. 18261, we took steps to accomplish both goals.[25]

59. In this proceeding, in our First Report and Order, we made 115 MHz available for land mobile facilities; and we prescribed the broad parameters for the systems approach to frequency allocation, assignment and use. In addition, in our Second Notice of Inquiry, we asked for proposals for making "most effective use" of the new spectrum, specifically requesting "innovative" ideas directed to the use of the 40 MHz we had

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[20] By 1933, for example, the Federal Radio Commission had issued a number of authorizations in the "Emergency Radio Service," including 111 municipal police stations, 12 state police stations, and 26 "Special Emergency Radio Stations." By 1948, we had 5,000 "Emergency" stations, including 4,137 Police Stations; approximately 3,000 stations in the land transportation category (railroads, transit operations, intercity buses, and taxicab companies); and 600 stations authorized under experimental and miscellaneous classifications.

[20] The regulations governing the "Domestic Public Radio Services" are now included in Part 21 of the rules.

[21] In 1949, there were about 12,000 licensees authorized to operate approximately 150,000 radio transmitters. By 1970 these numbers had grown to approximately 290,000 licensees and 3 million transmitters, respectively. See Land Mobile Use of TV Channels 14 through 20, 23 FCC 2d 325, at pp. 333–334.

[22] See Land Mobile Use of TV Channels 14 through 20, supra, at pp. 329–338; and Allocation of Frequencies Between 25 and 890 Mc/s, Report and Order, Docket No. 11997, 29 FR 4820 (April 4, 1964) at paras. 8 through 95. The value of land mobile radio was recognized early by other groups. As a result of their petitions, we instituted several rule making proceedings in which we established, in 1958, the Local Government, Manufacturers, Telephone Maintenance, and Business Radio Services.

[23] For example, we created additional operating frequencies by "channel splitting," whereby the separation between assignable frequencies was reduced. This "channel splitting" technique required more sophisticated radio equipment and tighter technical standards. We followed this process in a number of proceedings, the latest one in Docket No. 13847. See Channel Splitting in the 450–470 Mc/s Band, First Report and Order, Docket No. 13847, 5 FCC 2d 779 (1966).

[24] In this connection, we issued an "Order of Inquiry" in Docket No. 11997, 22 FR 2684 (April 17, 1957), which looked toward an examination of the frequency allocations between 25 and 890 Mc/s. Although this was a broad inquiry encompassing all of the radio services (Broadcasting, Common Carrier, and Safety and Special), the comments of the parties, as well as their oral presentations before the Commission en banc, were directed primarily to the needs and requirements of the land mobile radio services. This inquiry was concluded by our Report and Order, Docket No. 11997, 39 FCC 567, 29 FR 4820 (April 4, 1964). In that decision, while recognizing the requirements of the land mobile radio services for additional spectrum, for reasons that obtained then, we decided not to allocate additional frequencies to those services; rather, we instituted a number of proceedings and studies looking toward accommodating the needs for additional land mobile communication facilities through more intensive use of the spectrum already allocated for use in these services. See Report and Order, Docket 11997, supra, at para. 111. These efforts were pursued through the "Advisory Committee" we established for that purpose (See Public Notice, FCC 64–266, March 27, 1964); through the rule making and inquiry proceedings in Docket Nos. 15398 and 15399; and through a a staff group known as the "Land Mobile Relief Committee." The problem was also examined by presidential commissions (President's Commission on Law Enforcement and Administration of Justice; and President's Advisory Committee on Civil Disorders); and by Congress (see H. Rept. No. 91–982, 91st Cong., 2d Sess., April 7, 1970; H. Rept. No. 1978, 90th Cong., 1st Sess., December 23, 1968). Further in this regard see: Report of the Advisory Committee for the Land Mobile Services, November 30, 1967; the Report of the Joint Technical Advisory Committee of the Institute of Electrical and Electronics Engineers and the Electronic Industries Association, Spectrum Engineering, the Key to Progress, 1966; and the Report of the Telecommunications Science Panel of The Commerce Technical Advisory Board of the U.S. Department of Commerce, Electromagnetic Spectrum Utilization—The Silent Crisis, October 1966.

[25] In Docket No. 18261, we made spectrum available to accommodate "immediate" land mobile requirements through a plan for the shared use of a limited number (one and in some instances two) of the UHF TV Channels 14 through 20 (470–512 MHz) in ten of the largest urban areas. We also adopted measures to improve the methods for assigning and using these frequencies. For example, we departed from the "block" allocation approach and, instead, made the frequencies available in "pools." We also introduced frequency "loading" standards and station separation criteria ("reuse" standards) to assure that the new channels would be more effectively and efficiently used than they had been in the past. Other adjustments were made to carry out these objectives in further actions in this Docket. See Land Mobile Use of TV Channels 14 through 20, First Report and Order, Docket No. 18261, 23 FCC 2d 325 (1970); Land Mobile–UHF TV Channel sharing, Second Report and Order, Docket No. 18261, 30 FCC 2d 221 (1971); Land Mobile Use of TV Channels 14–20, Third Report and Order, Docket No. 18261, 36 FCC 2d 588 (1972); Public Safety Services, Fourth Report and Order, Docket No. 18261, 43 FCC

allocated to the Public Safety, Industrial, and Land Transportation Radio Services.[38]

60. The second phase of Docket No. 18262, extending from 1970 through 1974, produced exhaustive studies. A number of significant concepts were developed by various parties. Also, a number of important recommendations were made looking toward better spectrum management policies. Thus, the tenor of the overwhelming majority of the filings was that, although conventional land mobile radio systems would continue to play an important role in satisfying specialized communication requirements, new innovative techniques, specifically including "trunking" techniques, would be necessary for the more effective development of the new radio spectrum; and that a regulatory framework favoring free competitive market conditions would be essential in order to foster the introduction of "trunked" systems on a sufficiently large scale to justify the necessary investment. This was so, it was pointed out, because the basic radio equipment for use at 900 MHz would be more costly and also because of the need for sophisticated design features, e.g., the computers needed to make "trunked" systems work; the requirement for satellite receivers and associated wire line facilities; and other necessary elements of the new 900-MHz systems.

61. We knew the additional cost involved would be large and in many instances would discourage individual users from making the investment necessary to establish facilities of this kind. Therefore, it was important, in our view, to provide them with an alternative. The SMR system option we adopted was suggested by the parties and was shown to be a feasible mechanism through which modern, 900-MHz technology could be made available over a broad base to eligibles in the Public Safety, Industrial, and Land Transportation Radio Services. Before adopting this approach, we examined it carefully in all of its aspects and concluded it was the best option available for the purpose and was one consistent with public interest considerations.

The nature of the Public Safety, Industrial and Land Transportation Radio Services. 62. Initially, we wish to emphasis that SMR systems have been established to make it possible for eligibles in the Public Safety, Industrial, and Land Transportation Radio Services to obtain the radio facilities they need to carry out authorized licensee functions and activities.[38a] These facilities are to be used by them as a "tool" to permit them to fashion the required systems of communication to fit the particular function for which they are needed.

63. In this regard, the variety of system designs corresponds to the myriad of local governmental, industrial, and transportation functions into which they are integrated. For example, radio systems serving the communication needs of railroads are not the same as those needed by a metropolitan police department, nor are they the same as those needed to meet the state-wide coverage requirements of some electric and gas utilities or state police departments, or state forestry agencies. Also, there are many low-power radio systems designed to provide services within manufacturing plants, within building complexes, or at construction sites. Further, there are large systems comprised of several base stations and hundreds of mobile radio units, but there are also a great variety of small systems consisting of a base station and a few mobile units.

64. Most of these systems are used for dispatch purposes, i.e., for the transmission of orders to vehicles, in the field. Others are used for "operational" purposes—to allow supervisors in the field to coordinate and manage the activities of their field forces and to enable them to keep informed about developments at headquarters. Many radio systems are used in activities involving safety, so that instantaneous availability of communication channels is of vital importance. Message lengths and circuit discipline vary, and traffic patterns are not always the same, since they depend in essential ways on the activities in which radio is used. These illustrations show some of the ways in which radio is used and bring out the need for "flexibility" in designing facilities that will meet the specialized and particular requirements of the user, wherever that user may be, whether in a densely populated urban center; an isolated construction site or drilling area; along a remote pipe line right-of-way; or in locations where inherently "dangerous" activities are carried out, e.g., power generation, blasting, or remote control of locomotives.

65. In view of the variety of needs and the required flexibility in system design, structured, tariffed, regulated common carrier systems would be wholly ineffective in meeting these specialized requirements of land mobile users. Indeed, we believe it would be extremely difficult, perhaps not possible at all, to structure tariffs which would cover all of the almost infinite variety of service requirements. These requirements, in our view, can best be met in a climate of competition where there are multiple sources of supply and where eligibles can negotiate individually and independently for the specialized facilities they believe will best serve their purposes.

66. SMR systems have the flexibility needed to meet the needs of many small users or a few large ones. Thus, they can play a significant role in providing facilities for a number of independent radio users who will share base station facilities. They can also accommodate the requirements of a single user. For example, a municipality may contract with one or more entrepreneurs to construct and maintain communication systems designed specifically for its use.

67. This approach is consistent with existing practices under which land mobile radio licensees in the Public Safety, Industrial, and Land Transportation Services obtain the physical facilities they require to use radio in carrying out authorized activities. For a variety of reasons, but primarily because of the nature of the private dispatch market, carriers authorized in the Domestic Public Radio Services have not been responsive in meeting the specialized requirements we have described. The vast preponderance of these needs have been satisfied through individual arrangements negotiated by individual users under competitive market conditions—the same as those contemplated here. In short, we have concluded that the regulatory approach we have adopted is not only better suited to these services, but is the only approach which will permit users the full span of alternatives they should have in securing needed radio equipment for their use.

Application flow. 68. Currently, we process, yearly, over 120,000 applications in the Public Safety, Industrial, and Land Transportation Radio Services. These include applications for new, renewed, and modified radio station authorizations. We have, perforce, learned to dispose of these applications within 30 to 90 days. We plan to carry forward the practices and procedures that have made such efficiency possible into the processing of 900 MHz applications. To this end, all major policy issues have been worked

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2d 949 (1973); Land Mobile/UHF–TV Sharing Plan, Fifth Report and Order, 48 FCC 2d 360 (1974); and Reallocation of Mobile Channels in 470–512 MHz Band in New York and Los Angeles Urbanized Areas, 49 FCC 2d —— (1975), 39 FR 44204 (December 23, 1974), corrected, 40 F.R. 1021 (January 6, 1975). As part of our efforts to introduce new "efficiencies" in the assignment and use of the land mobile frequencies, the Stanford Research Institute was engaged to independently study land mobile spectrum utilization and to recommend methods and techniques for improving our frequency assignment practices and processes. See Dayharsh and Vincent, Report of Stanford Research Institute, "A Study of Land Mobile Spectrum Utilization," (1970) (hereinafter "SRI" study). Based primarily on the results of the SRI study, we instituted a pilot program to put into practice some of the management techniques developed by SRI which included intensive monitoring of land mobile frequencies with sophisticated equipment built for that purpose; and the use of computer technology for storing data and for calculating operational parameters and, additionally, for selecting frequencies for assignment to our licensees. Spectrum Management-Land Mobile Allocations, Second Report and Order, Docket No. 19150, 38 FCC 2d 625 (1973).

[38] First Report and Order and Second Notice of Inquiry, Docket No. 18262, 35 FR 8644 (June 4, 1970), at para. 38. See also para 7 where we stated that

> We will encourage and expect the design of new and highly efficient communication systems in the exploration of spectrum space newly allocated herein to the land mobile services, and para. 9 where we conclude that it is essential in the public interest that every encouragement be given to the development of new techniques in the efficient use of bands allocated for "private" land mobile systems * * *.

[38a] This SMR option is, of course, one of several alternative arrangements available to licensees in the Public Safety, Industrial, and Land Transportation Radio Services for providing themselves with the radio equipment needed to carry out authorized licensee activities and functions.

out in advance in rule making; the standards and conditions under which licenses will be granted have been perfected and included in the rules. This method, we believe, will allow us to process 900 MHz applications within periods ranging from 30 to 90 days, also."

69. Speed in the initiation of new service is important in the Public Safety, Industrial and Land Transportation Radio Services. Radio is an important "tool" in government and industry, not only promoting efficient use of capital plans and personnel, but also promoting the safety of people and property as well. Radio facilities must be available when they are needed. Obviously, if SMR systems are to serve as an effective option for eligibles in these services, they must be authorized under parallel procedures. Our plan provides for this.

Competition is necessary, feasible and desirable. 70. Our conclusion that competition would be preferable to regulation in promoting the best use of spectrum at 900 MHz is supported by the following reasons. First, the 900-MHz region of the radio spectrum is new and untried as far as land mobile communications are concerned. Although technical information developed in recent years indicates that frequencies in this range are suitable for land mobile purposes, uncertainties remain as to the precise propagation characteristics in this part of the spectrum. Radio equipment for operation at 900 MHz is now being developed. While we have "type-accepted" some models, there is as yet no large scale production." Further, as past experience indicates, additional models will have to be developed and improved before they will be fully accepted by the land mobile users. As importantly, radio system designs are in a developmental stage, particularly the "trunked" systems on which we have placed so much reliance. Although trunking technology is well known, automatic trunked systems have not been used in these services. Consequently, just how to design them to meet the large variety of special requirements of radio dispatch users must still be worked out under actual operating conditions. Significant investments must be made by existing radio equipment manufacturers, and new companies must be encouraged to enter the market, if the full potential of the advancing technology is to be realized. The system proposals which have been made thus far look promising, but development and experimentation remain to be done.

71. For full development of new types of radio equipment suitable for 900-MHz frequencies; for the new spectrally efficient communications systems we expect at 900 MHz, particularly the large trunked systems, and for the new communication techniques, such as non-voice uses, the manufacturers of radio equipment must put forth a substantial effort and must invest large sums of money at the developmental stage—far in advance of being able to sell their products. It is axiomatic that a potentially large market is needed to maintain the interest of manufacturers and to further encourage them to continue to make the kind of capital investments necessary for meaningful development of these systems. Unless we provide access to this market for all potential suppliers, we may not get the efficient new kinds of systems that are essential for the realization of the full and proper potential of the spectrum we have made available in the 900-MHz band. Based on the comments in this proceeding, we believe that the required market access will exist only if there is a regulatory approach which will allow entrepreneurs the freedom to enter the market place without regulatory restraints or delays. Thus, under the approach we have adopted, we will be able to authorize in a given area a large number of SMR and other systems and this will translate into a sufficiently large and diversified market nation-wide to warrant development of "trunked" and other systems and their production in sufficiently large quantities. In this way these kinds of systems would be made available to a large number of users and at reasonable costs. By contrast, a regulatory approach with limited entry or other common-carrier-type regulatory restraints in licensing SMR systems would, in our view, limit the market to be served by the large trunked and other communication systems and equipment designs, which we feel are needed, to the point where these kinds of systems would simply not come into existence. In summary, we believe that a competitive environment is necessary for the full development of the wide range of equipment and systems designs which will be required to promote and ensure the more efficient and effective use of the 30 MHz of radio spectrum at 900 MHz.

72. Our conclusion, here, is based not only on the persuasive presentations of the parties, but also on our experience with existing marketing practices. As a result of open entry policies, we would note that the private land mobile radio services have been able to grow rapidly and flexibly and have been able to respond meaningfully in meeting the expanding requirements for land mobile communications. In brief, this regulatory approach has been successful and has brought about many benefits to users in the Public Safety, Industrial, and Land Transportation Radio Services and, significantly we think, to the general public as well.

73. The 30 MHz of spectrum allocated can accommodate 600 single-channel conventional systems; or 30 20-channel trunked systems; or various other possible combinations in each market. Forty-five additional MHz have been placed in "reserve," and this "reserve" may be drawn upon to meet demands as they arise. The 30-MHz allocation alone, however, is adequate to provide high quality service to 60,000 or more mobile radio units in any one market. Thus, the new allocations will allow us to provide for a large number of competing systems and, it follows, competition is possible.

74. Competition is also feasible because the demand for land mobile communications is considerable and expanding steadily. To illustrate, in 1949 we had authorized about 150,000 radio transmitters in the Part 89, 91, and 93 services; by 1970 this number had grown to nearly 3 million; and our records indicate that in 1974 we had authorized over 6 million transmitters." Further, in 1970, we projected the number of authorized mobile units would double by 1980; and this estimate has been substantiated by our experience to date." Also, the volume of applications has been increasing steadily, so that each year the number received is approximately 10 percent greater than the number of proposals filed during the previous year. Moreover, with the availability of the new frequencies it is reasonable to anticipate an accelerated growth. This has been our experience each time additional spectrum has been made available. Further, new uses of radio, those developed and being developed, will add appreciably to the potential of the market. The comments point to these new uses of radio, non-voice communications, as growth areas; and there is substantial interest in them. This, too, supports our expectation for an expanded land mobile dispatch market at 900 MHz.

75. In summary, then, the allocation we have made for private dispatch systems and the prospective growth of demand, combined with relatively limited scale economies in SMR systems, allow us to conclude that competition is feasible and desirable.

Benefits. 76. Although we have mentioned some of the benefits we expect to flow from our decision to authorize SMR systems on an open entry, competitive basis in the Public Safety, Industrial, and Land Transportation Radio Services, we believe it will be helpful to summarize a number of the more significant benefits. Thus, SMR systems authorized on an open entry, competitive basis should:

(a) Foster the development and production of a wider range of models of the

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" As we pointed out in our Second Report and Order, this efficiency in application processing has not been possible in the Domestic Public Radio Services. In those services the practices are such that delays of up to a year are not uncommon and in many cases grants take up to 4 to 5 years. It is clear that procedures of that type would prevent us from meeting urgent demands for Safety and Special radio facilities; and this, in our view, would be contrary to manifest public interest requirements. See Land Mobile Radio Service, Second Report and Order, Docket No. 18262, supra, at p. 765, fn. 5 and associated text.

" "Type acceptance" is our program for assuring that radio equipment complies with our technical standards before being offered for sale. See Subpart J of Part 2 of the rules.

" The figures given are for "authorized" transmitters. While not all of the "authorized" transmitters are put in operation, these figures do show a rapidly growing demand for private land mobile facilities.

" Land Mobile Use of TV Channels 14 through 20, First Report and Order, Docket No. 18261, supra, p. 394.

new and improved radio equipment needed for operation on 900-MHz frequencies. This is important because 900 MHz is a new and untried part of the spectrum as far as land mobile use is concerned, and a wide range of new equipment designs will be required to take advantage of, and to adjust to, the propagation characteristics and technical limitations that obtain at this range of the spectrum.

(b) Stimulate the development and production of the spectrally efficient communication systems, particularly "trunked" systems, on which we have placed great reliance for improved efficiency in the use of the new spectrum. In "trunked" systems, for example, a "communication channel" can accommodate more users than in systems authorized in the past. Our loading standards are geared to this. While, for now, we have adopted conservative channel occupancy standards for "trunked" systems, we expect that, in the future, a greater number of users can be accommodated. This is significant, because radio spectrum is limited; and we have an obligation to see to it that it is used as fully and effectively as possible.

(c) Improve the quality of communication service to the users. In the past, frequency shortages and channel congestion have resulted in marginal service in terms of waiting time, message blockage, and, importantly, inability to establish new systems to accommodate new requirements. With sufficient spectrum and with the wide range of system designs, particularly the "trunked" systems we seek to foster, users will be able to obtain better quality service, not only in the immediate future but also in years ahead when the 900-MHz band will be fully populated with radio communication systems.

(d) Result in lower costs. Lower costs should come about through production of equipment and systems on a large scale and from the competitive forces of the market place. Also, with a large range of options available, through open entry, a user will be able to negotiate and obtain only those facilities which he needs and thus avoid the additional costs inherent in standardized systems.

(e) Be more responsive to the great variety of needs and requirements in the private dispatch service. In these services, there are large systems, small systems, high-powered systems, low-powered systems; "in plant" facilities; area-wide and state-wide systems, in-hospital and ambulance-to-hospital systems, digital systems, tone control systems, slave locomotive control systems, remote control systems for cranes and other heavy machinery, portable systems for police and fire departments, inter-system police systems, and many others. A competitive market, with open entry, should be more responsive to these varying kinds of needs of the users, in that, if a desired system is not available from one source, other sources will be there to supply it.

(f) Provide the flexibility needed in the dispatch field. The private dispatch field requires the "flexibility" inherent in a competitive market. With "flexibility" an individual user will be able to arrange or negotiate for the specific communication facility that will fit uniquely his particular requirement.

(g) Enhance the development of new communication techniques. New techniques, such as automatic vehicle location, telemetry, facsimile, status reporting, digital access to computers from mobile units and others are now in the process of being perfected and are expected to be important adjuncts to voice communications at 900 MHz. Free market entry will encourage the full development of these new techniques; and this will not only benefit the users, but it will lead to more efficient spectrum utilization.

Summary. 77. On reflection, our experience in the regulation of the Domestic Public Radio Services shows that, in conjunction with common-carrier-type regulations, unconscionable delays have resulted in making facilities available to the public without identifiable public benefits (such as lower costs to the users) for these delays. Moreover, the carriers, rather than meeting the requirements of private dispatch users, have concentrated on offering "radiotelephone" and one-way signalling services. Also, we are not dealing here with anything approaching a "natural monopoly" situation which might justify common-carrier-type regulation. Rather, we now have sufficient spectrum to enable us to authorize a significant number of competing SMR's in each market in the private dispatch field. In brief, we have not discerned any necessity for, or any benefit to be derived out of, common carrier regulation for our SMR option.

78. The record in this proceeding shows, and we find, that competition among SMR systems is reasonably feasible from technical and economic points of view and will serve the public interest. While courts have concededly imposed special strictures on our use of competition as a regulatory tool in businesses with a natural monopoly structure (see Hawaiian Telephone Company v. FCC, —— F. 2d —— (D.C. Cir. 1974)), it has never been held, nor, indeed, even suggested that the Commission could not opt for a competitive approach in the presence of a record adequate to show the feasibility and public interest basis of such action. On the contrary, as the Supreme Court made clear in RCA, supra, adequate public interest findings will support a policy of competition even in natural monopoly situations.[a] In contrast to the RCA and Hawaiian Telephone cases, this aspect of the present Docket does not involve a natural monopoly. The weight of the evidence supports, and therefore we find, that economies in this business would not reflect the increasing returns of scale that are the hallmark of the natural monopoly.[b] Without conceding, therefore, that it is necessary for us specially to find here that competition would be in the public interest—in light of the national policy favoring competition—such findings have nonetheless been made on the basis of the record evidence. Accordingly, nothing in RCA or Hawaiian Telephone would bar the action we have taken. See Washington Utilities & Transportation Commission v. Federal Communications Commission, —— F. 2d —— (9th Cir. 1975).

Impact of SMR systems on existing radio Common Carriers. 79. The Radio Common Carriers have argued that licensing SMR systems on a non-regulated basis would not be in the public interest, because this would lead to "destructive" competition between "regulated" and "non-regulated" entities. After full consideration, it appears to us that the carriers' fears are not well founded.

80. First, as we have described above, the private dispatch market is primarily a competitive one. Indeed, the carriers have not, to any significant degree, served the specialized requirements of eligibles in the Public Safety, Industrial, and Land Transportation Radio Services. Their offerings have been principally confined to radiotelephone and one-way

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[a] "We think it not inadmissable for the Commission, when it makes manifest that in so doing it is conscientiously exercising the discretion given it by Congress, to reach a conclusion whereby authorizations would be granted wherever competition is reasonably feasible. This is so precisely because the exercise of its functions gives it accumulating insight not vouchsafed to courts dealing episodically with the practical problems involved in such determination. Here, however, the conclusion was not based on the Commission's own judgment but rather on the unjustified assumption that it was Congress' judgment that such authorizations are desirable. Cf. Texas & Pac. R. Co. v. Gulf, C. & S. F.R. Co., 270 U.S. 266, 277."

"In reaching a conclusion that duplicating authorizations are in the public interest wherever competition is reasonably feasible, the Commission is not required to make specific findings of tangible benefit. It is not required to grant authorizations only if there is a demonstration of facts indicating immediate benefit to the public. To restrict the Commission's action to cases in which tangible evidence appropriate for judicial determination is available would disregard a major reason for the creation of administrative agencies, better equipped as they are for weighing intangibles 'by specialization, by insight gained through experience, and by more flexible procedure.' Far East Conf. v. United States, 342 U.S. 570, 575. In the nature of things, the possible benefits of competition do not lend themselves to detailed forecast, cf. Labor Board v. Seven-UP Co., 334 U.S. 344, 348, but the Commission must at least warrant, as it were, that competition would serve some beneficial purpose such as maintaining good service and improving it. Although we think RCAC's contention that an applicant must demonstrate tangible benefits is asking too much, it is not too much to ask that there be ground for reasonable expectation that competition may have some beneficial effect. Merely to assume that competition is bound to be of advantage, in an industry so regulated and so largely closed as is this one, is not enough." RCA case, supra, at pp. 96–97.

[b] It is, of course, the natural monopoly character of public utilities that makes them especially suitable subjects for common carrier regulation.

signalling. Moreover, the land mobile communications market, radiotelephone and dispatch, is expanding. Indeed, the main basis for our decision to allocate substantial new spectrum was our determination that there are present mobile radio communication requirements which, because of spectrum shortages, are not being met, and that these requirements will continue to grow and to expand in the foreseeable future. It follows, we feel, there will be no demonstrable impact on the function and service offered by the RCC's.

81. Our action in authorizing SMR systems need not be viewed by the radio common carriers as one that limits or restricts their business potential. Quite the reverse, in addition to their existing service, the RCC's will be entirely free to participate in the new 900-MHz private dispatch market. Moreover, we anticipate that they will use their organization and accumulated marketing and engineering expertise to play a major role in the establishment of both "trunked" and "conventional" facilities at 900 MHz. Thus, in view of the opportunities they will have for future growth, today's action is by no means inconsistent with the interests of the radio common carriers.[46]

Federal preemption. 82. In the Second Report and Order, we emphasized that the 30 MHz of spectrum space we allocated to the Public Safety, Industrial, and Land Transportation Services was made available as part of a comprehensive allocation plan under which frequency assignment, technical standards, and our operational rules are to apply nationwide. Moreover, each channel assignment will control where the next may be made, without regard to state boundaries or varying local jurisdictions. In these circumstances, we said, the methods which potential users may employ to make use of radio frequencies must also be compatible on a nation-wide basis. If they were not, we stressed, we would be unable to achieve our goal of bringing efficient, effective, and low-cost communications to the public. We still hold this view.

83. In this connection, our express responsibility under section 301 is to assure that the radio spectrum we have allocated to these services at 900 MHz is used effectively and efficiently. Thus, we developed separation standards designed to control where channels already assigned may be reused, as well as loading standards to assure the degree of channel efficiency that must be maintained. Further, our plan requires us to make specific frequency assignments to applicants as their proposals are received and reviewed; to determine whether, at specific points in time, frequency loading criteria are being met; whether persons requesting permission to use facilities are eligible (possess the necessary qualifications) to do so; and whether, in a given case, an additional channel or channels should be assigned (under controlling regulations) based on the use made of prior authorized stations."

84. Moreover, we made it clear that our 900-MHz plan called upon use to exercise continuing supervision over all phases of "use," that is, how authorized systems are being employed (operational methodology); by whom; for what purposes; and in what ways. In this regard, we required the submission of a continuing series of reports to keep us apprised on matters that would enable us to make our plan work in a way that would maximize the benefits to all users and at the same time maximize spectral efficiency."[47]

85. In addition, the planned 900-MHz systems will not necessarily be confined to those serving the needs of "local" users. There will be many of this type. But there will clearly be many more that will extend for many miles, traverse one political subdivision of a state and then another, and go from state to state. Thus, systems licensed to motor carriers, to railroads, to power and petroleum companies will not necessarily be, and generally are not, confined to one state or one jurisdiction. Accordingly, the plan does not contemplate per se intrastate operations. It is a national plan, with national ramifications; and in no instance will we be able to forecast what dimensions a particular system may take on. Those matters will depend upon a variety of factors and considerations; and our decision in each instance must be based on our measure of what the public interest requires in terms of the purposes and objectives sought to be attained through assignment and licensing of stations under the referenced 900-MHz regulatory plan.

86. In summary, then, our 900-MHz allocation scheme is an all encompassing one designed to meet the specific and particular requirements of persons we will license under regulations governing the Public Safety, Industrial, and Land Transportation Radio Services. It has been perfected by us to meet the specific and particular requirements of these defined classes of eligible users, not on a local, but on a national basis, wherever the eligible may be, without regard to state or local jurisdictional boundaries and limitations. In these circumstances, we think it is obvious that implementation of the plan must be under one direct authority. In short, centralized federal licensing is indispensable to the ultimate effectiveness of the measures we have adopted to control the use of the spectrum at 900 MHz and to ensure that it is fully and efficiently employed.

87. On this point, we take notice of various state and local franchising or licensing procedures which may impede the basic goal of our allocation to SMR operations. Indeed, the common carrier interests assert that such state or local limitations are properly the case. Since these existing and potential barriers are inimical to our licensing and allocation scheme, federal preemption of those functions is necessary to achieve the full and efficient use of the 900-MHz allocations.

88. We have, of course, reviewed the arguments of various parties that SMR's are "common carriers" under the Act, and that sections 2(b) and 221(b), therefore, preclude Commission preemption of any State regulation. However, we find these arguments both misplaced and premature. Irrespective of whether SMR's could be considered "common carriers" under sections 2(b) and 221(b), those provisions are expressly subject to the Commission's section 301 allocation responsibilities. The extent of our preemptive action today is confined to assuring—through centralized federal licensing—that the goals of our allocation program are realized. Indeed, we note that the "licensing" or "franchising" functions are not among those reserved to the states even with respect to common carriers subject to sections 2(b) and 221(b). Thus we are unable to perceive why or how our action should be viewed in conflict with our expressly mandated duty to license radio communication facilities. 47 U.S.C. section 301.

89. In sum, we feel that federal preemption of possible assertion of state entry certification over SMR's is essential to accomplishing the objectives of our 900-MHz allocation plan. In this regard, we have noted that rate-structured, common-carrier-type regulation is inconsistent with the free-market, competitive environment we feel is necessary to promote the full potential of our allocation of the spectrum to the Public Safety, Industrial, and Land Transportation Radio Services. Nevertheless, in this connection we need not assume that the states will adopt such burdensome regulatory measures on SMR licensed systems. Indeed, it is our hope and anticipation that the states will follow our lead towards a free, competitive environment for the SMR systems. Accordingly, while we are preempting jurisdiction over questions of entry, we have decided to defer judgment as to any action by the states relating to the regulation of other aspects of SMR operations.

Petition for stay. 90. The National Association of Radiotelephone Systems (NARS) has filed a petition requesting that we "stay" our decision in the Second Report and Order in this Docket "until final determination of Petitioner's appeal to the United States Court of Appeals for the District of Columbia Circuit . . . and, alternatively, suggests that the Commission on its own motion

[46] It is also worth pointing out that private radio systems, including systems operated under various sharing arrangements, have existed for many years; and while claims and forecasts of "dire" economic consequences have been made by the carriers, none have materialized. See Allocation of Microwave Frequencies Above 890 Mc/s, Report and Order, Docket No. 11866, 27 FCC 359 (1959); reconsideration denied, 29 FCC 825 (1960); and Cooperative Sharing of Operational Fixed Stations, Report and Order, Docket 16218, 4 FCC 2d 406 (1966).

[47] Second Report and Order, supra, fn. 2, at pp. 766.

[48] Second Report and Order, supra, fn. 2, at pp. 781–782.

suspend the effective date of its Order until further order to be issued after determination of all court appeals and petitions for reconsideration and proceedings consequent upon the foregoing."

91. In support of the relief asked, NARS alleges that its members are "suffering and will suffer irreparable injury as a result of the Commission's Order;" that the public "is irreparably injured by the disruption of the service of the RCC's even prior to the implementation of the Order;" that our decision "* * * is clearly unauthorized by the Communications Act" and contrary "* * * to clearly applicable court decisions and is sharply at odds with the Commission's own past decisions and policies." Further, NARS contends that our decision "* * * cannot be implemented for at leas ttwo years, and suspension of the effective date * * * will not substantially injure any of the parties." The relief asked will be denied.

92. Petitioner, NARS, has not made a showing sufficient to justify the stay or the total suspension asked in the implementation of this highly important decision. We want to emphasize that our decision, here, is the result of a more than 15-year effort both by the Commission and by all interested elements of the land mobile industry to resolve land mobile frequency problems by the allocation of additional spectrum in all of the land mobile radio services and by making this spectrum available at the earliest possible time. We have been involved in this effort, here, since 1968, nearly seven years; and it is vital that we bring this matter to a close as expeditiously as possible and thereby make the frequencies we have allocated for use in establishing important and essential communication systems available without further delay. In this context, the delay asked would clearly be detrimental to the public interest, convenience, and necessity.

93. The claims of injury made by NARS are, in our view, speculative; and pertain to the private interests of NARS's membership. They certainly are unwarranted particularly in view of our action in this case under which petitioner's members are given a full and complete opportunity to participate in the implementation of our plan for the development of our new 900–MHz allocations.

94. Further, as we have explained, we believe that our decision is consistent with the requirements of the Communications Act and controlling decisions. Therefore, we cannot agree with NARS's assertion that it will prevail on appeal. Nevertheless, implementation of our decision could not deprive petitioner's members the relief they ultimately seek, should NARS prevail on appeal.

95. As we mentioned in our Second Report and Order in the private dispatch field, relative to the 30 MHz made available to the Public Safety, Industrial, and Land Transportation Radio Services, we have set aside 300 of the 600 channel pairs to give us flexibility in carrying out our assignment and licensing policies in accordance with such requirements as develop in the future. Further, we have "reserve" spectrum of 45 MHz; and, therefore, we have the frequency resources to permit us to adjust to any future occurrence.

96. In addition, the SMR system option, to which NARS's argument in principal part is directed, is an alternative (demonstrably an important one) we have given to eligibles in the Public Safety, Industrial, and Land Transportation Services for obtaining the facilities needed in carrying out authorized licensees activities; and our new rules are fashioned in a way that, in the event the courts decide that our decision with respect to this option is not one we have the power to make, appropriate adjustments in our plan may be made. We want to be clear on this, our primary objective in the private dispatch field is to ultimately provide frequency resources and an effective regulatory approach to assure that the communication needs of the Part 89, 91, and 93 services are met. There is no challenge to our authority to license systems in these services in the manner in which this has been done in the past; and our allocation and assignment scheme is designed to permit us to go forward with this aspect of the plan regardless of whether the SMR option is retained in its present form or not.

97. Finally, the issues raised in this proceeding are severable. Thus, our decision on "cellular" systems and on general allocation matters, and also with respect to the allocation of 30 MHz to the private services, 40 MHz for "cellular" operation, and 45 MHz for "reserve" purposes, while generally a part of our overall plan for implementing our 900–MHz decision, is aimed at separate objectives which are severable and distinct. Any changes in the decision as to one of the elements need not affect, in any essential way, our decisions with respect to the others. In any event, assuming that the courts decide that we do not have the requisite authority to license SMR systems in the manner outlined in our decision, the remaining options we have provided for persons eligible in the Public Safety, Industrial, and Land Transportation Radio Services (namely, individual licensing and "shared" systems as to which no questions have been raised) may be implemented. Put another way, any changes or modifications as to one of the features of our overall plan need not affect our decision with respect to the others. In this connection, as we have just noted, we have retained sufficient flexibility with our 300-channel, 45-MHz reserves to permit us to make such adjustments as may become appropriate or necessary.

98. Accordingly, we see no justification for the delays that would result from granting NARS the relief it asks. Therefore, its requests are denied.

Other petitions. 99. A "Petition to Intervene" was filed by General Communications Engineering, Inc., asking that it be permitted to "intervene" in this proceeding and to present "comments" and "views" directed chiefly to certain alleged activities of Motorola Communications and Electronics, Inc., a subsidiary of Motorola, Inc., a manufacturer of land mobile radio equipment. This, of course, is not an adjudicatory proceeding; and "petitions to intervene," as such, are not applicable. Petitioner could have participated in this proceeding either at the comment stage or later during the statutory period established for reconsideration. Furthermore, the matters to which petitioner addresses itself are the subject of court action; they are not directly pertinent to the overall allocation and assignment plan with which we are dealing, here; and they could only relate to the qualifications of one of many possible potential applicants for 900-MHz licenses. Moreover, as we have indicated, it would be plainly in conflict with the public interest to delay implementation of our decision to go into the matters which petitioner has in mind. Therefore, the petition is denied.

100. The National Association of Radiotelephone Systems (NARS) has filed a "Supplement to Petition for Stay: Motion to Set Aside Previous Order; and Motion to Reopen the Proceeding and to Hold Evidentiary Hearing Before Full Commission." In this connection, it has also filed a "Motion for Leave to File Additional Pleading."

101. The principal ground for the relief asked was the recent filing of a "complaint" by the Department of Justice in the case entitled "United States of America v. American Telephone and Telegraph Company et al.", in the United States District Court for the District of Columbia. In its petition, NARS asks us to reopen the record and examine anti-competitive aspects of licensing manufacturers. The issues involving possible anti-competitive practices by wire line companies and by manufacturers were fully considered and measures were taken to safeguard against them. This has been done in our Second Report and Order, and we have further modified our plan in this decision. In view of the actions we have taken, directed to this subject, the relief asked is not warranted. Certainly an evidentiary hearing is not required; and, furthermore, as we have pointed out, the parties have had many years and many opportunities to develop their views in opposition to our plan on this and on other aspects, as well; and we can see no justification at all in granting relief that would result in additional long delays in making the frequencies available for use in land mobile systems of communication. Accordingly, NARS's additional requests for relief, referenced above, are denied.

Technical considerations pertaining to allocations and assignments in the Public Safety, Industrial, and Land Transportation Services. 102. The parties have raised a number of questions on technical points. Some say our classification of stations as urban-conventional and suburban-conventional is not practical. They feel that while the distinction might be useful in making assignments in certain parts of the country, it does not fit, for instance, the geographic characteristics of the Los Angeles urbanized area. There, the requirement is to serve broad areas, using mountain-top sites

which ring populated centers to the west. With the antenna height and power limitations prescribed, they feel this will be impossible. Accordingly, they ask that we drop the suburban-conventional classification entirely. However, if this is not done, they want us to correct or make clear just how the suburban-conventional and urban-conventional mileage separations are to apply.

103. Other parties ask that we not limit system configuration to "trunked" or "conventional" modes. They want to be allowed to use satellite receivers and transmitters to enchance coverage. This is of particular importance in hilly or mountainous regions and even in metropolitan areas where high buildings and other types of structures will shadow or block effective propagation of 900–MHz signals.

104. Also, they request that we clarify our intent as to permissible use of emissions such as F–2, F–4, and F–9. Further, they suggest that frequency stability requirements for "control" stations be made the same as those applicable to "mobile" transmitters and that the 250-watt limitation on base station power be modified, so that base station equipment can more readily be designed and manufactured to produce maximum permissible effective radiated power (ERP) of 1 kilowatt. Others ask that we revise the "temperature range" requirements for base stations, so this gear will be less expensive to produce.

105. Further, some parties would like us to simplify the method prescribed for computation of AAT (antenna height above average terrain) or to undertake to make the necessary computations ourselves. Then it is urged that use of the 900–MHz band by land mobile licensees be restricted to urban areas, leaving UHF–TV translator stations free to operate in the 900–MHz band in rural areas, where less land mobile congestion exists.

106. It is pointed out that we have not made adequate provision for the requirements of "ribbon-type" user—railroads, motor carriers, certain utility enterprises, and some police operations. Modifications to accommodate these eligibles are sought.

107. Finally, it is said that fixed operation on a secondary basis should not be prohibited; that mobiles should be allowed to operate on base station frequencies; and that mobile units should be permitted to act as mobile repeaters, where that type of operation is required in the conduct of authorized activities or functions of the licensee.

Matters relating to spacing and design of conventional and trunked 900–MHz systems. 108. The parties have raised questions concerning the methods set out in the rules for assigning frequencies in urban and suburban areas and for loading conventional and trunked systems. They urge that more efficient engineering methods could have been employed; and that fuller use of the spectrum could have been attained through case-by-case engineering of station authorizations and through channel monitoring and spectrum management techniques.

109. We are, of course, aware of the techniques mentioned; and our spectrum management program in Chicago is designed to develop and perfect the approaches suggested. However, our methodology, here, is, in terms of our present capabilities, the most appropriate to assure maximum effective use of the new frequencies. In this regard, we plan to require a relatively high level of channel occupancy; to exercise continuing supervision over channel use, thus assuring compliance with our loading criteria; and to assign channels so that they meet the specialized requirements of the various classes of users in accordance with traditional priorities accorded them.

110. Further, the mileage separations for trunked and conventional operations have been established giving full consideration to accepted standards of good engineering practice. The separations specified are designed to assure that only reasonable protection from co-channel interference is accorded the users; and these separations, in our view, are necessary to afford the grade or quality of service that 900-MHz systems must have. if sufficient interest is to be generated in them to justify the additional expense of operating at this range.

111. Moreover, we have said that we will resist all of the system parameters as we gain knowledge from actual operating experience; and that adjustments will be made as it becomes possible to do so. This is one of the objectives of our Chicago Spectrum Management Program. Nevertheless, we agree with some of the suggestions; and we are making such changes in our assignment methods as seem feasible at this particular time.

112. In the latter regard, where a licensee cannot cover his desired service area from a single transmitting site, we will permit the use of multiple sites, just as long as the combined signal contours of all the sites do not exceed our basic 40 dBu/20 mile limitation. We believe that multiple sites will introduce a significant degree of flexibility in system design, allowing licensees to fill dead spots and overcome other system deficiencies.

113. Further, with respect to trunked and conventional systems located in the Los Angeles area, we believe a departure from our basic urban/suburban licensing scheme is warranted. The very large geographical area of urban Los Angeles and its many suburbs and the presence of several very high mountain-top sites present circumstances which we believe are unique. Accordingly, when an applicant demonstrates a need to serve both the urban and surrounding suburban areas, we will permit him to utilize an ERP of 1 kilowatt on certain nearby mountain peaks. The effect of this action will be to extend the radius of coverage for these stations, enabling them to serve a significantly greater portion of the entire area than standard trunked or conventional systems. Such stations will be designated as "wide-area-coverage" stations, and will be the only ones permitted to use 1 kilowatt ERP with an antenna height above average terrain exceeding 1000 feet.[*]

114. In addition, we have taken into account the requirements of certain classes of users for ribbon-type systems. It is not our intention to exclude such systems; and we believe that our rules have sufficient flexibility to permit this type of operation. Thus, in considering applications for such systems, we will examine each proposal as a whole, rather than on an individual station basis; and we will authorize systems of this kind as long as licensing them is found to be consistent with the basic governing technical and frequency use standards we have adopted for 900-MHz facilities.

Emissions. 115. In their petitions, several parties pointed to the important role which non-voice communications can play in modern communication systems, and they have asked that provision be made for authorizing such methods of operation at 900 MHz. We recognize the potential of non-voice communications; and we plan to accommodate such uses when it is possible to do so. For this purpose, we will initiate studies, and to the degree necessary rule making, to develop the necessary policies and system loading parameters under which such methods of operation may properly be authorized on a regular basis. In the meantime, we have allowed for use of these techniques to the extent practicable, as our rules now provide. Thus, systems licensed in this band for use by a person or entity eligible under either Part 89, 91, or 93 may be used for the transmission of F2, F4, and F9 emissions, provided that the loading standard which applies to the system is met and the channel pairs are assigned for the exclusive use of the licensee. See § 89.655(c) at Appendix B.

116. For systems operating in the trunked mode, we will construe the assigned F3 emission designation to include transmission of non-voice signals on a calling channel used for the purpose of establishing and maintaining communications within the trunked network.

Frequency stability for control stations. 117. We have been asked to change the rules to allow control stations to have the same frequency stability as that which we have prescribed for mobile stations. It is pointed out that although control stations may technically be termed "fixed stations," they operate on mobile frequencies working through mobile relay stations; and it is suggested that they should not be required to meet more stringent stability requirements than mobile units. We

[*] We are taking a very practical approach here to the special situation presented in Los Angeles. If similar extenuating circumstances should become evident in other localities, we will address them at a later date. Further, these facilities will be authorized to those who have wide-area-coverage needs. In addition, such facilities will be authorized for SMR operations only where their use will be restricted to providing wide-area-coverage for persons with that kind of coverage requirement.

agree with this view; and, therefore, the stability requirements for control stations have been modified, accordingly.

Base station transmitter power output limits. 118. Transmitter power output limits were specified for stations in the 806–821 and 851–866 MHz bands in order to facilitate type acceptance procedures for equipment to be used in those bands. The limit specified in the rules is 250 watts for base stations. It is contended that this limit is not adequate for multiple transmitter groups used in trunked systems. It is said that the losses involved in combining the output of numerous transmitters to feed a single antenna could be substantial, and that a higher limit is needed in order to achieve 1 kilowatt ERP per frequency. We agree that such combining losses could reduce power output on the order of 3 to 6 dB, or more, depending on the particular hardware used. Additionally, we recognize that at 900 MHz antenna feedline losses could become very significant, on the order of 5 to 10 dB, in those installations where long runs of feedline are needed. Such feedline losses would affect the ability of both trunked and conventional stations to achieve 1 kilowatt ERP per frequency. We are therefore revising the maximum permissible transmitter power output to a limit of 2000 watts per frequency. This does not alter the maximum permissible ERP, which remains at 1 kilowatt per frequency.

Temperature range requirements for base station frequency tolerance. 119. The rules presently provide that base station frequency tolerance in the 851–866 MHz band must be maintained to 1.5 parts per million. Type acceptance provisions of Part 2 require tolerance to be maintained over the temperature range from −30° C to 50° C. It is asked that this temperature range be reduced to 0° C through 50° C for base stations. The wider temperature range, it is said, would present serious manufacturing and cost problems. However, narrowing the temperature range would have the effect of shifting some of the burden of maintaining adequate frequency tolerance from the equipment supplier to the equipment user. We are aware of the ramifications mentioned; but these standards apply to equipment used in other bands. Thus, the problem is one that is not within the scope of this proceeding; rather, it can best be handled in rule making directed more specifically to it.

Calculation of antenna height above average terrain. 120. An application for frequencies in the 806–821 and 851–866 MHz bands must include the base station antenna height above average terrain. It has been suggested that the Commission should perform this calculation. As desirable as this goal might be, we are not now in a position to assume that burden. We recognize that some cost to the applicant is involved; however, this cost is very small when compared to the other costs involved in getting a communication system into operation, and we do not feel that it is unreasonable to require applicants to furnish this information.

Secondary-fixed operations/mobile units on base station frequencies/mobile units as mobile repeaters. 121. Concern was expressed over our apparent exclusion of secondary fixed operations from the 806–821/851–866 MHz bands; and over the failure to allow mobile units to act as mobile repeaters and to permit mobile units to operate on base station frequencies. First, it was not our intention to exclude such operation completely. Rule § 89.655 does make provision for all three of these modes of operation, provided they are consistent with existing rules governing the service in which the licensee is authorized to operate, and provided that the applicable loading standards are met and the channel assigned has been made available for the exclusive use of that licensee.

122. Where a channel or channels are time-shared among two or more users, secondary fixed operations, mobile repeaters, and mobile units on base station frequencies will not be permitted. On these channels, the potential for intersystem interference and disruption of conventional base/mobile communications could be significant; and we are not going to allow such operation at this time.

Use of the 806–821 and 851–866 MHz bands in rural areas. 123. We have been asked that we not permit land mobile systems to operate in the 806–821 and 851–866 MHz bands in rural areas. The purpose of this request is to avoid possible interference with TV translator stations operating on those frequencies. We do not believe that such restrictions should be imposed. We have considered this particular matter in prior proceedings; arrangements to deal with this matter have been worked out; and we do not feel we should disturb our decision on this point.

Mileage separations. 124. Some parties have asked that we clarify the mileage separations specified in § 89.751 of the rules. Accordingly, the provisions of this rule have been revised to simplify the criteria that are to apply in assigning channels for use in "trunked" and "conventional" systems. We have also revised the mileage separations slightly to reflect certain factors which we believe should be included in the determination of the controlling separations. In addition, we have included separate provisions which take into account the special conditions that obtain when suburban-conventional and urban-conventional stations are interfaced. Finally, as we have mentioned, we have decided to treat the Los Angeles area as a special case, but with reference solely to the four transmitter sites specified at § 89.751(b) (1) and (5) of the rules; and we have added a provision to cover situations where stations on those sites are interfaced with other "trunked" or "conventional" systems. We believe that with these changes there should be no confusion as to what the applicable separation criteria are.

Miscellaneous matters pertaining to the 900-MHz allocation and assignment plan for public safety, industrial, and land transportation services. 125. Concern has been expressed about our statement that a 40 dBu signal contour of approximately 20 miles from the base station would provide "a high quality signal to about 50 percent of the locations, 50 percent of the time." It is pointed out that public safety entities "have a unique need for immediate and reliable communications," and that if our statement is to be taken literally, then the 806–821 MHz and 851–866 MHz bands will have a very limited usefulness to public safety licensees. To allay these fears, we believe that a fuller explanation of the propagation standards we used is in order.

126. The strength of a radio signal is a probability function involving spatial and temporal variability. For an observer at a fixed location, signal strength will vary with time, and for an observer in motion, signal strength will be a function of his particular location at a particular time. When empirical studies are done to ascertain signal strengths, observations and calculations are made to determine, for a given range of time and locations, what distribution of signal strengths occurs. A notation of the form F(L, T), is assigned to each data point or set of data points, with the symbol 'L' representing the location variability percentage, and the symbol 'T' representing the time variability percentage. The three most commonly used notations in our R–6602 propagation curves are F(50,50), F(50,10), and F(50,90). In all three cases, the location variability percentage is 50 percent, meaning that the median signal level at 50 percent of the locations on the perimeter of the service area will equal or exceed the value under consideration, and the median signal level at the remaining 50 percent of the locations of the perimeter of the service area will be equal to or less than the value under consideration. The three time variability percentages, 50 percent, 10 percent, and 90 percent, indicate that the signal strength under consideration will be exceeded for 50 percent, 10 percent, and 90 percent of the time, respectively, at 50 percent of the locations on the perimeter of the service area.

127. The percentage figures used are standard notations and not to be interpreted literally. We were simply noting the statistical variabilities which are inherent in the specification of any signal level. For a system engineered to provide a signal level of 40 dBu F(50,50) at the perimeter of the service area, greater and lesser signal values will be repeatedly encountered within the service area. Clearly, however, the mean signal level within the service area will be greater than 40 dBu, and will tend to be inversely proportional to the distance (raised to the fourth power) between the mobile unit and the base station. Assuming a receiver sensitivity of 0.45 microvolts to produce a 12 dB SINAD signal at the mobile unit, a useable signal should be received by mobile units operating in 95 percent of the service area for 95 percent

of the time. We expect that users will have no difficulty meeting their communication needs under these conditions. In fact, these values represent a considerable improvement over service generally available in systems licensed in other land mobile bands.

Construction and loading of "conventional" systems. 128. Objections were made to the period prescribed for loading "conventional" systems. Also, a question was raised as to the construction period for "conventional" systems. We had included none. The reference, here, is to § 89.802(c) of the rules. The provision as it stands is consistent with the philosophy of regulation we have adopted for 900-MHz systems under which we have sought to insure that the channels which we make available to eligibles are put in "use" and put in "storage." For this purpose, we have made it mandatory that the channel or channels assigned be "occupied" in accordance with express loading criteria or, if they are not, they become available for assignment to other users. These assignments are to be made by us; and all licensees should understand (and we have made it abundantly clear) that they take their authorizations subject to this condition. Furthermore, the period of eight months is consistent with that specified at § 1.932 of the rules. For these reasons, and for those which we have previously expressed, this requirement will not be changed.

"Five channel limit" for conventional systems. 129. Some parties have asked that we abandon the mandatory limit on the number of channels we will permit for use in the "conventional" system mode. These parties feel that there should be no such limitation; rather, that each case should be evaluated in terms of the showing of need made by the applicant. On this, we have emphasized the importance of "trunked" systems in terms of maximizing spectral efficiencies. On the other hand, we have recognized the value of "conventional" operation for smaller systems; and we selected the five channel limitation only after much thought. It strikes a good balance, in our view, between when "conventional" operation is desirable or needed and when "trunking" becomes feasible and where the inherent advantages of "trunking" come into play. Accordingly, we will not modify our plan in this regard at this time.

130. Nevertheless, some clarification as to how we are going to assign channels for "conventional" use is in order. As our rules provide, applicants must meet our loading criteria. Thus, where an applicant can meet the loading standards for a facility in the Police Radio Service, as an example, he will be assigned a channel pair, if he certifies that the assigned channel will be loaded to 70 percent of the required 50 mobile unit specification. See § 89.802 of the rules. This means that within a period of eight months, he must have in operation 35 mobile (vehicular) units. Should that licensee find that his requirements have exceeded his expectation and his assigned channel becomes loaded to 90 percent of its specified capacity, he may then apply for an additional channel. In contrast, should the applicant be a relatively large police department, it could request a maximum of 5 channels for use in "conventional" mode; but that would be the limit. If there should be a need on the part of this applicant/licensee for additional facilities for use in his police operations, then his system must go over to "trunked" operation.

131. On this point we should say that where the applicant is a local government entity that requests radio facilities for functions other than "police" operations, say for its fire or its highway maintenance departments, then it can apply for conventional systems for these distinct purposes. However, if the system is to serve, as it can in the Local Government Radio Service, all municipal functions or a number of them, then the applicant/licensee must look to "trunking" to meet these kinds of communication requirements. But we are not saying that where a licensee has functions which are related, yet are conducted independently, either in terms of the "function" being carried out or geographically, that he is bound by the five channel limit. Common sense must come into play; and we will exercise informed discretion in cases of this kind, obviously.

132. A further point in clarification is asked concerning SMR system licensing. First, our intention is that where an SMR licensee provides facilities for an "individual" eligible user, then the SMR licensee will stand in the shoes of that user; and what we have just said, above, relative to "conventional" system operation will apply.

133. A second situation arises where an SMR licensee plans to provide physical base station facilities to a number of eligibles in any of the service groups or combination of groups set out at § 89.802 of the rules, then the five channel limit applies for that particular market. Thus, when an SMR licensee needs additional channels (over five) in that market, the system must be "trunked." We have given the reasons why. They pertain to spectral efficiencies we expect to attain at 900 MHz.

134. The next logical question, one that has been asked, is what is a "market." This needs some clarification. We had originally thought of a "market" as being the establish "Urbanized Areas." However, this has given some of the parties concern, for these "areas" are constantly changing; and further there is some question as to the usefulness and the appropriateness of such an approach for our purposes. On reconsideration, we feel that a more definite criterion is needed; and we think this should turn on station coverage.

135. In this connection, suburban-conventional and urban-conventional facilities, those which we authorize for operation with maximum facilities, are designed to provide a 40 dBu signal at approximately 20 miles from the location of the base station transmitter. Los Angeles is an exception; but the same principle we are developing, here, would apply. In these circumstances, one method of defining a market would be this service area. It would include over 1,000 square miles; and this is a relatively large area. Accordingly, it would seem that we could reasonably adopt a definition of the term "market" to preclude licensing of more than five channels (for use in "conventional" mode) in that area. But this would not give the licensee a choice of establishing separate single-channel systems or a single five-channel system in that "market" or "area," simply because there would be no reference point, save in the instance in which the single five-channel method of operation was employed. Thus, to retain this flexibility in station location, we have decided to define a "market" as that area encompassed by the 40 dBu contour of a conventional facility using maximum permissible power and antenna height. However, where the licensee of an SMR system has specific multiple locations, he may not establish a second five-channel conventional station, if there is any overlap of the 40 dBu contour of the proposed new facility and any of the 40 dBu contours of stations previously authorized to him. In other words, we are going to look to every conventional system licensed to an SMR entity in determining whether an additional conventional channel is to be made available for his use, so that where a five-channel system is situated at a given point, then the next conventional station licensed to this particular licensee must be at least 40 miles distant.

"Ribbon" and "large area" or "regional" conventional operations. 136. We have previously said that we will look at proposals for "ribbon" type systems and at those used over "large areas" or "regions" as applications for a "system." There remains the question as to how our loading criteria are to apply. Again, we can understand the concern of the parties on this point, but it is obvious that there must be some measure of "common sense" or "judgment" in cases of this kind. Clearly, we did not mean to exclude users in this class from access to the 900-MHz channels. These users are ones engaged in very important activities, e.g., railroad, motor carrier, state police, and petroleum operations and like functions. These eligibles employ a number of base stations situated, at times, along their "right-of-way," or at different strategic points within a state or a region, or over several states and in several regions. They have requirements such that their emergency units or their trains and trucks traverse large areas (or along long routes) and they must communicate with a number of base stations along the way. In these circumstances, application of the loading criteria will conform to the nature of the licensee's operation. Thus, we never intended, and we are not going to require now, that these eligibles justify the assignment of co-channel base stations on the basis of mobiles associated with any particular base station. The test, rather, will be one of reasonableness, with a showing that

the channel will be used consistent with the loading prescribed.

Construction and loading of "trunked" systems. 137. Modification of our rules governing the construction and loading of "trunked" systems is asked. Some of the parties feel that the "one year" construction period is too short. Others would like to be allowed to proceed with construction in "five-channel" stages, loading each five-channel group, first, and then proceeding with construction of a second five-channel group. On reconsideration, we have given much thought to this problem; and we can understand why it might be more desirable, from a capital investment point of view, to go forward slowly. As we understand it, a maximum power, "trunked" facility will cost something on the order of 2 million dollars, depending on a number of factors. Whatever this figure is, whether it turns out to be greater or less than this estimate, we further realize that the initial investment for the basic elements of the system which are required regardless of the number of channels will be proportionally heavy. Thus, should we permit licensees to proceed in five-channel stages, it is not likely that there would be any incentive not to go forward with completion of the system, as the greater the capacity it has, the greater will be the return on the investment. So we are disposed to go along with this recommendation. However, we still must emphasize that our objective, here, is to maximize spectrum efficiency and to get these systems established, because they are needed to achieve the degree of efficiency at 900 MHz we feel is desirable in terms of the public interest. Therefore, in reaching some balance between that objective and the monetary considerations mentioned, we are going to modify our loading requirement for "trunked" systems to specify that the licensee must show that the system is being developed and loaded so that we can reasonably expect that it will be in full use in the five year term. Thus, we will permit the licensee of a "trunked" facility which has been assigned more than the minimum five channels to proceed with construction as proposed, i.e., in five channel stages; however, the basic facility designed to accommodate a minimum of five channels in "trunked" mode must be completed within the one-year limit specified in the rules. Further, where the licensee elects to proceed in this fashion, he must show that his system is "occupied" to 70 percent of its capacity at the end of a period of two years from the date of the grant of his station authorization. If it is not loaded to this capacity, the unused channels may be assigned to others. On the other hand, if the licensee elects to proceed with construction of the total system, as prescribed at § 89.801a()(2), then the norms set out, there, will control.

Trafficking. 138. Reference in the petitions has been made to the possibility of "trafficking" in licenses. In this regard, it is of concern that individuals with no intention of constructing or operating requested 900-MHz facilities will apply merely to be in a position to "sell" the authorization or, put in other terms, to "market" his "place in the processing line." This is of real importance, here, because we plan to process applications on a first-in, first-out basis; and in such circumstances, it is vital that all persons applying have a bona fide intention of implementing their authorization. Otherwise, these individuals would be in position to defeat our purpose of making these channels available as quickly as possible and of having them in "use" at the earliest possible date.

139. We have guarded against this kind of practice through our mandatory construction and loading requirements. But we feel that we should go further to preclude this possible abuse of our processes. Accordingly, we will not allow amendment of any application, whether for a "conventional" or a "trunked" system, to specify a "new" applicant. We will not consider the amendment as proposing a "new" applicant, where it involves an assignment or transfer of control to a parent or subsidiary of the same corporate entity; or where otherwise there is no substantial change in ownership or control of the applicant. This applies regardless of the nature of the legal entity. Thus, if the applicant is a partnership, the addition or substitution of "a" partner will be allowed, but only if the basic partnership structure remains unchanged.

140. Furthermore, once a license is granted, it may not be assigned nor may there be a transfer of control prior to the construction of the facility authorized. In this connection, the same basic policies that we have said will apply prior to a grant of a license for a "trunked" or "conventional" station will control. Finally, these prohibitions are not to be applicable in cases of "involuntary" transfers or assignments in cases of death or insolvency.

Cancellation provision. 141. There were some requests that we modify our provision on cancellation of contracts concerning the "leasing" of equipment from SMR licensees. The regulation in question provides that the user of an SMR system who elects to "lease" the equipment from the licensee of that station must be given the right to cancel the lease agreement at anytime, without penalty, on 10 days' written notice to the licensee. Section 89.656 of the rules. The fear was expressed that this provision would impose great hardships on small companies and would enlarge undesirably on the ability of the larger companies to dominate the market.

142. This provision was designed to give eligible users mobility in the market to secure the best possible service at reasonable charges. We thought it necessary, because at this time it is not possible to compel such uniformity in equipment that would enable eligibles to use such gear as they had contracted for in other systems when the SMR service was not satisfactory. Further, the concept was to protect the small user; not larger entities that have inherent bargaining power. And we can understand how some companies that might be interested in becoming SMR licensees would be totally discouraged, if they did not have the right to rely on a contract. Taking both views into account, we think a reasonable solution, one that meets our purpose, would be to make this rule applicable only in those instances where the lease arrangement involves 5 transmitting/receiving units or less. Accordingly, § 89.656 will be so modified.

Clarification asked on other points. 143. A few other points in clarification will be discussed. First, there was some confusion as to when applications would be accepted for filing. On this, we will not accept any application until the new form we mentioned in the Second Report and Order has been approved through prescribed procedures. But we will give notice when the forms have been so approved; and this notice will be given reasonably in advance of the date we will specify for first filing of applications at 900 MHz.

144. The same problem exists with respect to "type acceptance" of equipment. The parties want to know whether they can file applications without specifying "type accepted" equipment. They would like to be given the opportunity of submitting their applications and committing themselves to use "type accepted" equipment in their stations. Should there be none, of course, the inference is that they would then request additional time to construct and load. We understand the nature of the problem; but we must go forward in accordance with accepted and established practices. Thus, if the equipment to be used is not "type accepted" then the application will not be accepted; and it should not be filed. To be clear on this, we will not accept or consider any proposal for a system at 900 MHz which does not specify the use of equipment that has been "type accepted." This means that the applicant cannot rely on what he might have been told or promised as to the availability of "type accepted" equipment in the future; it must be radio equipment that, on the date when the application is submitted is "type accepted."

145. Finally, some clarification as to our "interconnection" requirement, set out at § 89.653 of the rules, is asked. A number of parties point out that at night and over weekends and holidays their main "offices" or "places of business" are closed, yet they have a requirement for dispatching their mobiles to serve their customers. They feel our restriction on "interconnection" would prohibit this method of operation. We have said that "interconnection" must be accomplished "manually" at the licensee's or user's "place of business," and that it may not be accomplished at any "station" or "control point common to more than one user." But this would not preclude the type of arrangements the parties seem to refer to. Thus, if a licensee has an authorized "control station" or "control point" at a location other than his principal office to permit him, through an employee or agent, to dispatch his mobiles during periods when his principal

office is closed, he may use this arrangement, just as long as the "control point" or "control station" is used exclusively for his purposes. It may be not be shared.

146. Another point raised goes to our requirement that "interconnection" be accomplished "manually." Some licensees would like to use "automatic" type equipment and not literally have to make the "patch" "manually" between their radio facilities and those of the wire line telephone company. What we have in mind, here, is that our transmitter control requirements be observed; and that there be some person under the control or supervision of the licensee present to assure that the station is being operated only for permissible purposes and that our technical and operational requirements are being met. This ultimate objective, of course, can be met whether "interconnection" is carried out "manually" or through the use of what the licensee may feel is more efficient means. We see no reason why this cannot be allowed. Again, though, the "interconnection" must take place at the location from which the transmitter is controlled; and there must be some person stationed there that can perform the required "control" functions as prescribed by the rules governing the Parts 89, 91, and 93 radio services.

147. Accordingly, *It is ordered*, That the petitions for reconsideration directed to our Second Report and Order in this proceeding are granted, to the extent set out in the foregoing opinion; and are denied in all other respects..

148. *It is further ordered*, That the petition for stay and associated relief, and the supplement to petition for stay and for other associated relief, filed by the National Association of Radiotelephone System, are denied.

149. *It is further ordered*, That the petition to intervene, filed by General Communications Engineering, Inc., is denied.

150. *It is further ordered*, effective May 5, 1975, That Parts 2, 18, 89, 91, and 93 of the rules are amended as shown in Appendix B, attached hereto. Authority for this Action is found in sections 1, 4 (i) and (j) and sections 301, 303, 308, and 309 of the Communication Act of 1934, as amended.

151. *It is further ordered*, That FCC Form 400–S is adopted.

152. *It is further ordered*, That this proceeding is terminated.

(Secs. 1, 4, 301, 303, 308, 309, 48 Stat., as amended, 1064, 1066, 1081, 1082, 1084, 1085 (47 U.S.C. 151, 154, 301, 303, 308, 309))

Adopted: March 19, 1975.

Released: March 20, 1975.

FEDERAL COMMUNIATIONS COMMISSION,
[SEAL] VINCENT J. MULLINS,
Secretary.

APPENDIX B[1]

Parts 2, 18, 89, 91, and 93 of Chapter I of 47 CFR are amended as follows:

[1] Appendices A, C, D, E, and F filed as part of the original document.

PART 2—FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS: GENERAL RULES AND REGULATIONS

1. In § 2.106, columns 5 through 11 of the table are amended for the frequency bands 470–902, 902–928, and 928–960 MHz; the text of footnote US215 is amended and that footnote designator is inserted in column 6 besides the bands 470–902 and 928–960 MHz listed in column 5. The amended text reads as follows:

§ 2.106 Table of Frequency Allocations.

United States		Federal Communications Commission				
Band (MHz)	Allocation	Band (MHz)	Service	Class of Station	Frequency (MHz)	Nature of SERVICES of stations
5	6	7	8	9	10	11
•	•	•	•	•	•	•
470–902	NG. (NG30) (NG43) (NG63) (NG65) (US36) (US88) (US100) (US116) (US215)	• • •	• • •	• • •	• • •	• • •
		806–821	LAND MOBILE.	Land Mobile.		Conventional and trunked systems.
		821–825	LAND MOBILE.			Reserve.
		825–845	LAND MOBILE.	Land Mobile.		Cellular systems.
		845–851	LAND MOBILE.			Reserve.
		851–866	LAND MOBILE.	Base.		Conventional and trunked systems.
		866–870	LAND MOBILE.			Reserve.
		870–890	LAND MOBILE.	Base.		Cellular systems.
		890–902	LAND MOBILE.			Reserve.
902–928	G. (US215) (US116)				915	Industrial, scientific, and medical equipment.
928–960	NG. (US36) (US116) (US215)	928–947	LAND MOBILE.			Reserve.
		• • •	• • •	• • •	• • •	• • •

• • • • • •

U.S. FOOTNOTES

• • • • • •

US215 Radiocommunications services operating in the band 890–940 MHz must accept any harmful interference from the operation of any ISM device operating in accordance with FCC standards in effect as of the date of manufacture of the ISM device.

• • • • • •

PART 18—INDUSTRIAL, SCIENTIFIC, AND MEDICAL EQUIPMENT

§ 18.13 [Amended]

2. In § 18.13, footnote 2 to the table is deleted.

§ 18.141 [Amended]

3. In § 18.141(a), footnote 2 to the table is deleted.

4. In § 18.144(b)(1), the introductory text is revised to read as follows:

§ 18.144 Procedure for type approval.

• • • • • •

(b) • • •

(1) The frequency at all times during the tests below shall be maintained within 70% of the tolerance specified in § 18.141(a), except for equipment operating on 915 MHz, for which it shall be maintained within 100% of the tolerance specified in § 18.141(a).

• • • • • •

PART 89—PUBLIC SAFETY RADIO SERVICES

5. In § 89.103(a), the table is amended to add footnote 6 as follows:

§ 89.103 Frequency stability.

(a) • • •

Frequency range	All fixed and base stations	All mobile stations	
		Over 2 watts	2 watts or less
MHz	*Percent*	*Percent*	*Percent*
• •	•	•	•
806 to 821	[6] 0.00015	0.00025	0.00025
• •	•	•	•

• • • • • •

[6] For control stations, the frequency stability is 0.00025 percent.

• • • • • •

6. Section 89.105(c) is revised to read as follows:

§ 89.10[illegible] Types of emission.

• • • • • •

(c) Except as provided in § 89.655(c), operation in the frequency bands 806–821 and 851–866 MHz is limited to F3 emission.

§ 89.111 [Amended]

7. The text of footnote 3 to the table in § 89.111(b) is revised to read:

[3] The output power of a transmitter on any authorized frequency in this service shall not exceed 2000 watts (33 dBW).

8. In Section 89.602, the definition of "Duplex radio communication" is deleted and the definition of "Conventional radio system" is revised to read as follows:

§ 89.602 Definitions.

* * * * *

Conventional radio system. A method of operation in which one or more radio frequency channels are assigned to mobile and base stations but are not employed as a trunked group. An "urban-conventional system" is one whose transmitter site is located within 15 miles of the geographic center of any of the first 50 urbanized areas (ranked by population) of the United States. A "suburban-conventional system" is one whose transmitter site is located more than 15 miles from the geographic center of the first 50 urbanized areas. See Table 21, Rank of Urbanized Areas in the United States by Population, Page 1–87, U.S. Census (1970); and Table 1 of paragraph (g) of § 89.751 of this subpart.

* * * * *

9. In Section 89.604, paragraph (d) is deleted and paragraphs (b) and (c) are revised as follows:

§ 89.604 Eligibility.

* * * * *

(b) Any person or entity proposing to provide private dispatch service, subject to the restrictions set forth in this subpart, to any person or entity eligible for licensing under either Part 89, 91, or 93 of this chapter, on a not-for-profit, cost-shared basis.

(c) Any person or entity, except wire line telephone common carriers, proposing to provide, on a commercial basis, base station and ancillary facilities for the use of persons or entities eligible under Part 89, 91, or 93 of this chapter.

10. Section 89.651 is revised as follows:

§ 89.651 Limitations on power and antenna height.

(a) The maximum effective radiated power and antenna height, respectively, for base stations used in suburban-conventional systems of communication operating in the 851–866 MHz band shall be no greater than 500 watts (27 dBw) and 500 feet above average terrain (AAT), or the equivalent thereof determined from Table 1 of paragraph (c) of this section. These are maximum values, and applicants will be required to justify power levels and antenna heights requested. For service area requirements less than 20 miles in radius, see Table 2 of paragraph (c) of this section.

(b) The maximum effective radiated power and antenna height, respectively, for base stations used in trunked and urban conventional systems authorized in the 851–866 MHz band shall be no greater than 1 kilowatt (30 dBw) and 1000 feet above average terrain (AAT), or the equivalent thereof determined from Table 1 of paragraph (c) of this section. These are maximum values, and applicants will be required to justify power levels and antenna heights requested. For service area requirements less than 20 miles in radius, see Table 3 of paragraph (c) of this section.

(c) Table 1. Equivalent powers and antenna heights for base stations in the 851–866 MHz band which have a requirement for a 20 mile service area radius.

Antenna height (AAT) (in feet)	Power watts[1]	
	Urban/trunked	Suburban
Above 5,000	65	15
4,501 to 5,000	65	15
4,001 to 4,500	70	20
3,501 to 4,000	75	25
3,001 to 3,500	100	30
2,501 to 3,000	140	35
2,001 to 2,500	200	50
1,501 to 2,000	350	80
1,001 to 1,500	600	160
501 to 1,000	[3] 1,000	220
Up to 500	1,000	[4] 500

[1] Power is given in terms of effective radiated power (ERP).

[2] Applicants in the Los Angeles, Calif., area who demonstrate a need to serve both the downtown and fringe areas will be permitted to utilize an ERP of 1 kw at the following mountain top sites: Santiago Peak, Sierra Peak, Mount Lukens, and Mount Wilson.

[3] Stations with antennas below 1,000 ft (AAT) will be restricted to a maximum power of 1 kw (ERP).

[4] Stations with antennas below 500 ft (AAT) will be restricted to a maximum power of 500 w (ERP).

TABLE 2.—*Equivalent powers and antenna heights for suburban-conventional base stations in the 851–866 MHz band which have a requirement for less than a 20-mile service area radius—Maximum effective radiated power (watts)*

Service area radius (miles)	Base station antenna height (AAT)					
	401–500	301–400	201–300	101–200	51–100	0–50
20	500	500	500	500	500	500
19	400	500	500	500	500	500
18	310	385	500	500	500	500
17	235	300	385	500	500	500
16	175	230	285	440	500	500
15	130	160	215	330	500	500
14	95	120	155	240	480	500
13	70	85	115	175	350	500
12	50	60	80	125	250	500
11	35	45	60	90	180	360
10	25	30	40	60	120	240
9	15	20	25	40	80	160
8	10	12	15	25	50	100
7	6	7	10	15	30	60
6	3	4	5	7	15	30
5 or less	1	2	3	4	8	16

TABLE 3.—*Equivalent powers and antenna heights for urban-conventional and trunked system base stations in the 851–866 MHz band which have a requirement for less than a 20-mile service area radius—Maximum effective radiated power (watts)*

Service area radius (miles)	Base Station Antenna Height (AAT)							
	751–1,000	501–750	401–500	301–400	201–300	101–200	51–100	0–50
20	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
19	800	1,000	1,000	1,000	1,000	1,000	1,000	1,000
18	640	830	1,000	1,000	1,000	1,000	1,000	1,000
17	480	625	960	1,000	1,000	1,000	1,000	1,000
16	360	470	720	900	1,000	1,000	1,000	1,000
15	270	350	540	675	875	1,000	1,000	1,000
14	200	260	400	500	650	1,000	1,000	1,000
13	140	180	280	350	450	700	1,000	1,000
12	100	130	200	250	325	500	1,000	1,000
11	70	90	140	175	230	350	700	1,000
10	45	60	90	110	145	220	440	1,000
9	30	40	60	75	100	150	300	600
8	20	25	40	50	65	100	200	400
7	15	20	30	40	50	80	160	320
6	8	10	16	20	25	40	80	160
5 or less	5	6	9	12	15	25	50	100

(d) The maximum output power of the transmitter for mobile stations is 100 watts (20 dBW).

11. Section 89.653 is revised as follows:

§ 89.653 Restriction on interconnection.

Radio systems licensed under this subpart may be interconnected with the wire line facilities of any telephone company; Provided, however, such interconnection is accomplished at a control point or control station, which is situated at a fixed location (not in a mobile unit), licensed to the user, where a person immediately responsible for the operation of the base station is on duty, and where all of the requirements of either § 89.113, 91.107, or 93.107, whichever is applicable, are met. Provided, further, that such interconnection may not be accomplished at any control station or control point facility licensed to, or used by, any person other than the licensee.

§ 89.654 [Deleted]

12. Section 89.654 is deleted.

13. Section 89.655 is revised as follows:

§ 89.655 Restrictions and limitations on permissible communications, on use, and on mode of operation.

(a) Systems licensed to provide service to persons or entities eligible under Part 89, 91, or 93 of this chapter may, in conformity with the following restrictions, be used:

(1) Only for purposes expressly allowed under Parts 89, 91, and 93 of this chapter.

(2) Only by persons who are eligible for facilities, either under this subpart or in the radio services included under Parts 89, 91, and 93 of this chapter.

(3) Only for the transmission of messages or signals permitted in the service in which the participants are eligible.

(4) Only in the private dispatch mode of operation.

(b) Except as provided at paragraph (c) of this section, radio systems licensed under this subpart may be used for voice communications (telephony), only.

(c) Notwithstanding any contrary provisions in this subpart, a system licensed for use by a person or entity eligible under either Parts 89, 91, or 93 of this chapter may be employed for any purpose or operated in any manner, including the use of F2, F4, and F9 emissions, which is consistent with the regulations governing the service in which the user is eligible; *Provided*, That the loading standard which applies to the system is met and the channel or channels are assigned to that person or entity for its exclusive use.

14. Section 89.656 is revised as follows:

§ 89.656 Special conditions governing the furnishing of radio equipment by licensees.

Every licensee of a trunked or conventional system furnishing base station facilities on a commercial basis, under this

subpart, shall afford users the option of purchasing, leasing, or renting the associated control and mobile station radio gear. Should a user elect to lease or to rent the equipment and should the lease or rental arrangement involve no more than five (5) transmitting/receiving units, the user must be given the further right to cancel the lease or rental agreement at any time, without penalty, on ten days' written notice.

15. Section 89.657 is revised as follows:

§ 89.657 Restriction on licensing manufacturers in the 806–821 MHz 851–866 MHz bands.

No person engaged in the manufacture or production of radio frequency ("RF") equipment to be used in systems authorized under this subpart, or any person directly or indirectly controlled (through stock ownership or otherwise) by such manufacturing entity, may be licensed to operate more than one trunked system of communication to be used in providing base station and ancillary facilities to eligibles under either Part 89, 91, or 93 of the rules.

16. Section 89.701 is revised as follows:

§ 89.701 Forms to be used.

Applications for conventional and trunked radio facilities shall be submitted on FCC Form 400, and such applications shall be filed with the Commission, at its offices in Washington, D.C. Where the facility is to be established in the Chicago Regional area, FCC Form 425 shall be used and all such applications shall be filed with the Chicago Regional Office. In addition, FCC Form 400–S shall be filed by all applicants.

17. In § 89.702, paragraphs (a) and (c) are revised to read:

§ 89.702 Supplemental information to be furnished by applicants for facilities under this subpart.

(a) Applicants for conventional or trunked systems of communication shall, in addition to the information required by FCC Form 400 or FCC Form 425, furnish the following data and material:

(1) Where the applicant is a person proposing to provide dispatch service to eligibles under either Part 89, 91, or 93 of this chapter on a not-for-profit, cost-shared basis, he shall furnish:

(i) A copy of the plan or agreement under which service will be offered. It must be in sufficient detail to show that such service will be provided at cost.

(ii) A statement of the purposes for which the system is to be used and of the planned mode of operation.

(iii) The names and addresses of each person to participate in the sharing arrangement.

(iv) A statement showing that each participant is eligible to use the system for the purposes for which it is to be employed.

(2) Where the applicant is a person proposing to provide dispatch service to eligibles under either Part 89, 91, or 93 of this chapter, on a commercial basis, he shall supply:

(i) A statement of the purposes for which the system is to be used and of the planned mode of operation.

(ii) A statement certifying that no person not eligible to use the proposed facility for the purposes for which it is to be authorized will be offered or provided service over or through the licensee's base station facility.

(iii) A copy of the basic agreement under which the dispatch service will be offered.

(3) Where the applicant is a person subject to the provisions of § 89.657 of this subpart, he shall furnish the following information:

(i) A list of any trunked stations licensed to the applicant.

(ii) A list of any trunked stations licensed to any other person or entity directly or indirectly controlled by the applicant or which directly or indirectly controls the applicant.

(4) All applicants for conventional radio systems shall furnish a list of all conventional radio systems licensed to them or proposed by them within forty (40) miles from the location of the base station transmitter site of the facility applied for.

* * * * *

(c) All applicants of trunked systems shall specify the number of mobile units to be placed in operation within the term of the license; *Provided, however,* Where the applicant applies for more than the minimum 5 channels, and elects to construct in 5-channel stages, he shall so specify and shall state the number of mobile units to be placed in operation by the end of two years from the date of the grant of his station authorization.

* * * * *

18. In § 89.703, paragraph (h) is revised to read:

§ 89.703 Supplemental reports required of licensees authorized under this subpart.

* * * * *

(h) All licensees of trunked systems shall report, within seven (7) months of the date of the grant whether or not construction of the authorized facility has begun, and, within thirteen months of the date of the grant, whether or not construction of the facility has been completed.

19. In Section 89.704, paragraph (a) (5) is revised to read:

§ 89.704 Processing of applications.

(a) * * *

(5) Where, upon examination, it is determined that the proposal cannot be granted or dismissed, but that it must be designated for hearing, such action will be taken.

20. In § 89.751, paragraphs (e), (f), and (g) are re-designated as (f), (g) and (h), respectively; paragraph (b) is revised and a new paragraph (e) is added to read:

§ 89.751 Selection and assignment of frequencies.

* * * * *

(b) Stations authorized by the Commission to operate in the 806–821 and 851–866 MHz band will be afforded protection solely on the basis of the mileage separation criteria set out below. Only co-channel interference between base station operations will be taken into consideration. Adjacent channel and other types of possible interference will not be taken into account.

(1) For trunked systems, the minimum separation between co-channel systems must be 70 miles, except that no trunked system shall be less than 105 miles distant from co-channel wide area trunked systems on any of the following mountain top sites: Santiago Peak, Sierra Peak, Mount Lukens, Mount Wilson (California).

(2) For urban-conventional systems, co-channel base stations will be authorized only when the separation between the centers of the urban areas involved is at least 100 miles.

(3) For suburban-conventional systems, co-channel base stations will be authorized only when the separation between the centers of the suburban loading areas involved is at least 110 miles.

(4) For a suburban conventional system to operate co-channel with an urban conventional system, the distance between the center of the urban area and the center of the suburban loading area must be at least 110 miles.

(5) The minimum distance from any of the following four sites: Santiago Peak, Sierra Peak, Mount Lukens, and Mount Wilson (California) to the center of the nearest co-channel "urban" area, must be 120 miles; and to the center of the nearest co-channel suburban loading area (for a suburban-conventional station), must be 130 miles.

* * * * *

(e) Notwithstanding the provisions of paragraph (b) (5) of this section, where a channel is assigned for use at either Santiago Peak, Sierra Peak, Mount Lukens, or Mount Wilson (California) and the channel is not fully loaded in accordance with applicable loading criteria, the Commission may issue additional authorizations for wide-area-coverage facilities to be located at the same site area until the channel in question is occupied in conformity with applicable loading criteria. A channel previously assigned at one such site area may not be used at any of the three remaining designated mountain-top sites.

* * * * *

21. In § 89.801, Table 1 of paragraph (b) is amended by deleting the designation "Radiotelephone Group", together with the corresponding loading criteria associated with "Radiotelephone Group", and paragraph (e) is amended to read:

§ 89.801 Trunked systems.

* * * * *

(e) Licensees of trunked facilities must commence construction within six

months from the date of grant and complete construction within one year; *Provided, however,* That a licensee of a "trunked" facility assigned more than the minimum five-channel group may elect to construct the facility in stages. In this event, the licensee shall complete construction of the basic five-channel group of the authorized facility within the time limites given above; *Provided, further,* That should the licensee elect to proceed in this manner, then he must demonstrate that at the end of a two-year period from the date of the grant of his station authorization, the constructed facility is occupied to a minimum of 70 percent of the loading required, notwithstanding the provisions of paragraph (c) of this section.

22. In § 89.802(b), the table is revised to read:

§ 89.802 Conventional systems.

* * * * *

(b) Table 1, Loading requirements for conventional systems.

Service group	Channel loading—units per channel vehicular/portable		
	Single licensee/ user	2 to 5 licensees/ users	Over 5 licensees/ users
Police and fire group	50/100	40/80	30/60
Business radio group	90/180	70/140	50/100
Taxicab radio group [1]	150	125	100
Motor carrier radio group (urban and inter-urban passenger motor carriers, only)	150/300	125/250	100/200
Other services group	70/140	50/100	40/80
Mixed service group [2]		70/140	50/100

[1] No loading criteria for portable units in the taxicab radio group are given, since the requirement for units of this type has not been established in that service.

[2] Full sharing of channels allocated in the 806–821 and 851–866 MHz bands is permissible; and where the eligibles in 1 service share facilities in common with persons eligible in 1 of the other radio services, i.e., where channels are jointly used on this basis, then the loading criteria shall be 70/140 or 50/100 mobile and portable units per channel, as shown.

* * * * *

23. In § 89.803, paragraph (b) is revised; paragraph (d) is deleted; paragraph (e) is re-designated as paragraph (d), and paragraph (f) is re-designated as paragraph (e) and revised. As amended, paragraphs (b) and (e) read:

§ 89.803 Other criteria to be applied in assigning channels for use in conventional systems of communication.

* * * * *

(b) Where an applicant proposes to furnish service to eligibles under either Part 89, 91, or 93 on a commercial basis, using a conventional system of communication, its application will be considered on the same basis as that of an applicant for private or shared communication facilities.

* * * * *

(e) There shall be no limit on the number of systems authorized to operate in any one given area except that imposed by allocation limitations; and no person authorized to operate any radio facility under the provisions of this subpart shall have a right to protest proposals on grounds other than violation of or inconsistency with the provisions of this subpart. All grants are made subject to this condition and to the other conditions and standards set out in this chapter.

* * * * *

24. A new section is added to read:

§ 89.805 Limitation on the number of frequencies assignable for conventional systems.

(a) The maximum number of frequency pairs that may be assigned to any one licensee for the operation of a conventional radio system shall be five, except for licensees in the Taxicab Radio service.

(b) Where an applicant proposes to operate a conventional radio system to provide facilities for the use of a single person or entity eligible under Part 89, 91, or 93 of this chapter, he may be assigned only the number the frequency pairs justified on the basis of the requirements of the proposed user of the system.

(c) No more than five frequency pairs may be assigned to any person proposing to operate one or more conventional radio systems to provide facilities for use by more than a single entity, if there is any overlap of the 40 dBu contour of the proposed new facility and any of the 40 dBu contours of any station authorized to that person, or to any person or entity in which he has a direct or indirect interest.

(NOTE.—For the purposes of this subsection, the 40 dBu contour is assumed to be that obtained using maximum effective radiated power and antenna height permitted by this subpart.)

25. A new section is added to read:

§ 89.806 Limitation on the number of frequency pairs assignable for trunked systems and on the number of trunked systems.

(a) The maximum number of frequency pairs that may be assigned for the operation of a trunked radio systems shall be twenty. The minimum number of frequencies that may be assigned for the operation of such a system shall be five.

(b) No more than a single trunked system will be authorized to any one licensee to provide radio facilities for the use of more than a single person or entity where the 40 dBu contour of the proposed facility will overlap the 40 dBu contour of any existing facility of the licensee, or of any concern in which he has a direct or indirect interest, or for which applications are pending, except where the applicant shows:

(1) That the additional trunked system will be used to provide radio facilities for a single entity, where the additional system is justified on the basis of the requirements of the proposed single user; or,

(2) That radio systems previously authorized to the applicant are being operated to at least 90 percent of their authorized capacity.

NOTE.—For the purposes of this paragraph, the 40 dBu contour is assumed to be that obtained using maximum effective radiated power and antenna height permitted by this chapter.

26. Section 89.807 is added to read:

§ 89.807 Special licensing requirements for radio systems used to provide service to persons other than the licensee.

Where a conventional or a trunked radio system is to be used to provide radio facilities to a single user or to multiple users, on a commercial basis, any associated control points, control stations, and mobile radio stations shall be authorized only to the user of those particular facilities.

27. Section 89.808 is added to read:

§ 89.808 Special limitations on amendment of applications on assignment or transfer of authorizations for radio systems used to provide service to persons other than the licensee.

(a) No application for a conventional or trunked radio system proposing radio facilities to be made available for use by a single user or by multiple users on a commercial basis may be amended so as to substitute a new entity except in the following circumstances:

(1) The amendment does not involve a substantial change in the ownership or control of the applicant; or,

(2) The changes in the ownership or control of the applicant are involuntary due to the original applicant's insolvency, bankruptcy, or death.

(b) A license to operate a radio facility for the purposes described in paragraph (a) of this section may not be assigned or transferred prior to the completion of construction of the facility. Provided, however, the Commission may give its consent to the assignment or transfer of control of such a license where the applicant shows:

(1) That the assignment or transfer does not involve a substantial change in ownership or control of the authorized radio facilities; or,

(2) That the assignment or transfer is involuntary due to the licensee's insolvency, bankruptcy, or death.

PART 91—INDUSTRIAL RADIO SERVICES

28. In § 91.102(a), the table is amended to add footnote 7 to the frequency range 806 to 821 MHz to read as follows:

§ 91.102 Frequency stability.

(a) * * *

Frequency range	Transmitter (input) power			
	Fixed and Base Stations		Mobile Stations	
	Over 300 watts	300 watts or less	Over 3 watts	3 watts or less
MHz	*Percent*	*Percent*	*Percent*	*Percent*
*	*	*	*	*
806 to 821	[7] 0.00015	[7] 0.00015	0.00025	0.00025
*	*	*	*	*

[7] For control stations, the frequency stability is 0.00025 percent.

* * * * *

29. Section 91.103(c) is revised to read:

§ 91.103 Types of emission.

* * * * *

(c) Except as provided in § 89.655(c), operation in the frequency bands 806–821 and 851–866 MHz is limited to F3 emission.

30. In § 91.106(b), the table and footnote 3 are amended as follows:

§ 91.106 Power and antenna height.

* * * * *

(b) * * *

Frequency range	Maximum plate power input to the final radio frequency stage	Maximum effective radiated power
MHz	*Watts*	*Watts*
* *	*	* *
806 to 821	(3)	(3)
851 to 866	(3)	(3)
* *	*	* *

* * * * *

[3] The output power of a transmitter on any authorized frequency in this service shall not exceed 2,000 w (33 dB W).

* * * * *

PART 93—LAND TRANSPORTATION RADIO SERVICES

31. In § 93.102(a), the table is amended by adding footnote 6 to the frequency range 806 to 821 MHz to read as follows:

§ 93.102 Frequency stability.

(a) * * *

Frequency range	All fixed and base stations	All mobile stations	
		Over 3 watts	3 watts or less
MHz	*Percent*	*Percent*	*Percent*
* *	*	*	*
806 to 821	[6] 0.00015	0.00025	0.00025
* *	*	*	*

[6] For control stations, the frequency stability is 0.00025 percent.

* * * * *

32. Section 93.103(c) is revised to read:

§ 93.103 Types of emission.

* * * * *

(c) Except as provided in § 89.655(c), operation in the frequency bands 806–821 and 851–866 MHz is limited to F3 emission.

33. In § 93.106(b), the table and footnote 5 are amended as follows:

§ 93.106 Power and antenna height.

* * * * *

(b) * * *

Frequency range	Maximum plate power input to the final radio frequency stage	Maximum effective radiated power
MHz	*Watts*	*Watts*
* *	*	* *
806 to 821	(5)	(5)
851 to 866	(5)	(5)
* *	*	* *

* * * * *

[5] The output power of a transmitter on any authorized frequency in this service shall not exceed 2,000 w (33 dBw).

* * * *

[FR Doc.75-7922 Filed 3-28-75;8:45 am]